CHAPTER 4

Environmental Setting and Environmental Impacts–Remaining Phase 1 and Phase 2 Sites

SECTION 4.1

Introduction to the Analysis

Chapter 4

Environmental Setting and Environmental Impacts–Remaining Phase 1 and Phase 2 Sites

4.1 Introduction to the Analysis

As discussed in Chapter 1, this part of this document is a Master EIR (CEQA Guidelines Section 15175 et seq.), which, among other purposes, is intended to form the basis for later decision making. Accordingly, the impact assessment in this part is conducted at a programmatic level. Site-specific CEQA/NEPA analyses will be required in the future to evaluate and document individual rehabilitation projects proposed for implementation. Those project-level analyses may involve more detailed descriptions of specific resources that could be affected by the activities described in Chapter 2. The project-level impact analysis for the Remaining Phase 1 sites is provided in Part 2 of this document.

This chapter presents an analysis of the potential environmental impacts associated with implementing the proposed activities at the Remaining Phase 1 and Phase 2 sites. The analyses are presented by environmental resource area. Chapter 3, Regulatory Setting, provides the context with respect to federal, state, and local acts, regulations, and policies. As described further below, the analysis for each resource area includes discussions of the existing environmental setting, applicable significance criteria, potential environmental impacts, and mitigation measures. The following resource areas are addressed in this chapter:

- land use
- geology, fluvial geomorphology, minerals, and soils
- water resources
- water quality
- fishery resources
- vegetation, wildlife, and wetlands
- recreation
- socioeconomics, population, and housing
- cultural resources
- air quality
- aesthetics
- hazards and hazardous materials
- noise
- public services and utilities
- transportation/traffic circulation

This chapter focuses on those resources identified pursuant to CEQA. Two additional issue areas specific to NEPA, Tribal Trust and Environmental Justice, are analyzed in Chapter 7 of this document.

4.1.1 Environmental Setting

The setting sections for each resource area describe the existing regional and local conditions using the most current information available. Under CEQA, the environmental setting is intended to mean the environmental conditions as they exist at the time when the Notice of Preparation was issued. The information in these sections is used as the environmental baseline for analyzing the significance of potential effects of the Proposed Project and the significance of the effects of project alternatives with respect to each specific resource area (CEQA Guidelines, Section 15125 (a)). Consistent with the intended uses of a Master EIR, the descriptions of potentially affected resources in this chapter take a large-scale, region-wide view of existing environmental conditions. To the extent possible, the chapter also provides information useful in characterizing the resources associated with the Remaining Phase 1 and Phase 2 sites.

4.1.2 Environmental Impacts

Under CEQA, the concept of environmental "impacts" or environmental "effects" (the terms are used synonymously), as well as the determination of the significance of those impacts, is focused on changes in the existing physical conditions in the affected environment. Effects analyzed under CEQA must be related to a physical change.

The impacts of the project are identified and the level of significance of the impacts is determined in the following sections of this chapter. The impact analyses consider the type, size, location, and intensity of the potential effects associated with the activities proposed under the Proposed Project and alternatives. Consistent with the intended functions and uses of a Master EIR, these analyses provide a basis for the tiering of subsequent site-specific analyses, including the assessment of the potential impacts associated with the proposed rehabilitation activities for the Remaining Phase 1 sites as appropriate. Part 2 of this document, specifically Chapter 7, provides an expanded discussion of the resource impacts that could occur at the Remaining Phase 1 sites, beyond the discussion provided in Chapter 4.

The following subsections are also presented in the Environmental Impacts section for each resource area:

Methodology

This subsection identifies the methods used to analyze impacts, as well as the key assumptions used in the analysis process. Sections that incorporate quantitative assessments reference complementary technical appendices, as appropriate. Key assumptions used in qualitative analyses are described for those sections that do not rely on quantitative tools.

Significance Criteria

This subsection presents the criteria and thresholds used to identify potentially significant effects on the environment, in accordance with California Public Resources Code (PRC) Section 21082.2 and CEQA

Guidelines Sections 15064 and 15065. "Thresholds" include guidance provided by the CEQA Guidelines, agency standards, legislative or regulatory requirements as applicable, and professional judgment. All impacts that do not exceed the stated significance criteria described for each section are assumed to be less than significant and are therefore not discussed in detail in the document (PRC Section 21100 and CEQA Guidelines Section 15128).

Summary of Impacts Table

At the beginning of the Impacts and Mitigation Measures subsection is a table that identifies all of the impacts evaluated for that particular environmental issue area (i.e., Land Use, Fishery Resources, etc.). Included in this summary table are the various levels of significance (i.e., no impact, less than significant, significant) for the alternatives associated with the proposed project, including the No-Project Alternative. The tables also indicate what the level of significance would be after mitigation is implemented.

Impacts

At the end of each impact statement heading, the impact significance determination (i.e., no impact, less than significant, significant) is provided for each alternative evaluated. Following the impact statement, a detailed impact analysis is provided. In instances where the effects of one alternative are similar to another alternative, redundant impact analysis is avoided and a simple statement is made to the effect that the impacts of the two alternatives are similar. An example of the impact analysis structure is provided below:

Impact 4.3-2: Construction activities associated with the project could potentially result in increased erosion and short-term sedimentation of the Trinity River. *No impact for No-Project Alternative; significant impact for Proposed Project and Alternative 1.*

No-Project Alternative

Under the No-Project Alternative…

Proposed Project

Construction activities associated with the…

Alternative 1

Erosion and short-term sedimentation associated with Alternative 1 are similar to those of the Proposed Project…

Mitigation Measures

Mitigation measures that would reduce significant impacts associated with each of the alternatives to less-than-significant levels are provided after each impact discussion. In those instances where no feasible mitigation can be identified, such impacts are identified as significant and unavoidable. An alphanumeric coding system is used to present each mitigation measure. For example, Mitigation Measure 4.3-2a would correspond to the first mitigation measure for the second impact listed in the discussion of impacts in Chapter 4.3. Following the mitigation measure(s) is a subheading entitled "Significance After Mitigation" that identifies the level of significance following implementation of the prescribed mitigation measure(s). In those instances where no mitigation measures are proposed because the impact was not significant, a "Not Applicable" statement follows this subheading. An example of the mitigation measures structure is provided below.

Mitigation Measures

No-Project Alternative

Since no significant impact was identified, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project

4.3-2a Reclamation shall clearly identify all ...

Alternative 1

4.3-2a Reclamation shall clearly identify all ...

Significance after Mitigation

Less than significant…

4.1.3 Mitigation and Monitoring Program

California Public Resources Code section 21081.6(a), subdivision (a), however, requires lead agencies under CEQA to "adopt a reporting and mitigation monitoring program… in order to mitigate or avoid significant effects on the environment."

Throughout this Master EIR, mitigation measures are clearly identified and presented in language that will facilitate establishment of a monitoring and reporting program. In addition, Chapter 2 includes a number of design elements and construction criteria that are incorporated into the project description for both action alternatives. Relevant information described in Chapter 2 will also be included as environmental commitments in conjunction with any mitigation measures adopted by the Regional Water Board as conditions of project approval. These conditions of project approval will be included in a Mitigation Monitoring and Reporting Program (MMRP) to verify compliance. The Draft MMRP is included as Appendix E, and the Final MMRP will be included as an appendix to the Final Master EIR. The approval of such a program will be part of any action taken by the Regional Water Board with respect to the Proposed Project. When other state, regional, or local agencies subject to CEQA approve portions of the Proposed Project under their jurisdiction or regulatory power, these "responsible agencies" will be required to adopt their own MMRPs (*CEQA Guidelines*, Section 15097, subd. (d)).

SECTION 4.2

Land Use

4.2 Land Use

This section describes land uses known to occur in the Trinity River basin in proximity to the proposed Remaining Phase 1 and Phase 2 sites along the Trinity River. It also evaluates potential impacts to land uses from implementation of the Proposed Project.

4.2.1 Environmental Setting

Regional Setting

Existing Land Uses

The Trinity River basin comprises the majority of Trinity County and the easternmost portion of Humboldt County. The terrain is predominantly mountainous with numerous lakes and rivers. The basin has little available farming area. Two scenic byways cross Trinity County, SR 299 and SR 3.

The largest town in the region is Weaverville; the next largest towns are Hoopa, Hayfork, and Lewiston. Most of the Hoopa Valley Indian Reservation is located in the basin. Land use in the basin is highly influenced by sizable amounts of public, Tribal, and private forest lands, much of which is used for timber production or other natural resource-related uses. Private land use adjacent to the Trinity River is generally limited to scattered residential and commercial development along SR 299, which is the primary travel corridor through Trinity County, connecting the Central Valley to the east with the coastal communities of Humboldt County.

Figure 4.2-1 illustrates the land ownership patterns in the Trinity River basin. Approximately 75 percent of the land in Trinity County (1,543,066 of the county's 2,052,980 acres) is under federal jurisdiction (Center for Economic Development 2007). The majority of federal lands are managed by the USFS (1,463,870 acres). Other federal land holdings are managed by BLM (78,928 acres) and Reclamation (268 acres).

With a population totaling approximately 15,000, the Trinity River basin is very lightly populated. Residential, commercial, and industrial development tends to be concentrated on relatively flat areas near the Trinity River or its tributaries, as typified by the population centers of Weaverville, Hayfork, Lewiston, Willow Creek, and Hoopa. Collectively, these communities house two-thirds of the basin's population, with the majority residing in Trinity County, which has a population of approximately 14,024 (Center for Economic Development 2007).

The development potential of most of the land in the basin is restricted by topography, limited private land ownership, and Timber Production land use zoning, which applies to most private land and allows only limited residential development. Both Trinity County's General Plan (Trinity County 2003) and the Hoopa Valley Indian Tribe's planning policies steer development toward previously developed areas and discourage development on resource lands.

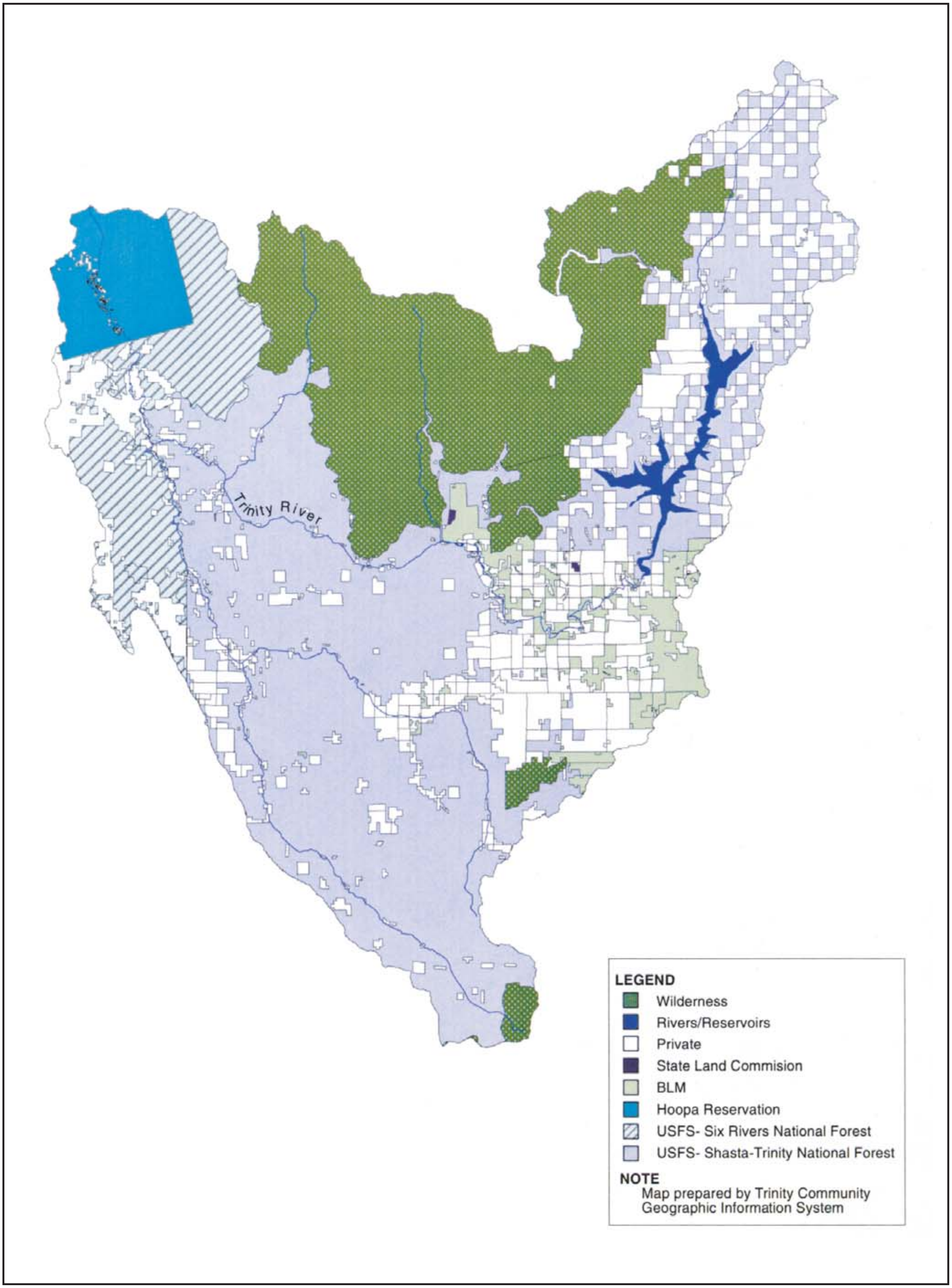

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Figure 4.2-1
Trinity River Basin Land Ownership

Small communities such as Lewiston, Douglas City, and Junction City are situated adjacent to the Trinity River in areas where terrain is relatively gentle. Development in these rural communities is primarily residential, typified by scattered single-family residences and mobile homes. Much of this residential development has encroached on the river's floodplain and the floodplains of some of its tributaries. Some mineral resource development (e.g., gold mining, commercial aggregate) also occurs along the river corridor.

Regional Land Use Planning

BLM's Redding Field Office, the Shasta-Trinity National Forest, Six Rivers National Forest, Reclamation, CDFG, and the California Department of Water Resources (DWR) manage public lands in the Trinity River basin. Public lands in the basin are managed for multiple uses in conformance with specific agency guidance documents. BLM lands are managed in accordance with BLM's Redding Resource Management Plan (RMP), and USFS lands are managed in accordance with the Shasta-Trinity National Forest Land and Resource Management Plan (LRMP) and the Six Rivers National Forest LRMP. These plans discuss the general condition of natural resources in the plan area and prescribe appropriate land use management for lands within the plan jurisdiction (see Section 4.2.2). Figure 4.2-1 illustrates the location of lands managed by these public agencies in the Trinity River basin. The following land use types are applied to STNF and BLM federal lands located in the Proposed Project area.

Trinity and Humboldt counties are responsible for land use planning for private lands in the Trinity River basin. The Land Use Elements of the county general plans discuss general land uses that exist within the counties and define land use types, called general plan land use designations, which are applied to private lands (Table 4.2-1) (Humboldt County 1984; Trinity County 2003). County general plan land use designations in the Proposed Project area are presented below under Local Setting.

The Hoopa Valley Tribe is responsible for land use planning for lands located in the Hoopa Valley Reservation. Like the county general plans, the Hoopa Valley General Plan discusses land uses that exist within the reservation and defines land use types (i.e., land use designations) that apply.

Local Setting

The project area is located in the Trinity River basin near the communities of Lewiston, Douglas City, Junction City, and Helena, California. Lewiston is located 35 miles west of Redding and 15 miles east of Weaverville, California, and has a population of approximately 1,300 people (U.S. Census Bureau 2000). Douglas City, near the junction of SR 3 and SR 299 approximately 6 miles south of Weaverville, has an estimated population of 714. Junction City and Helena are located on SR 299 approximately 9 and 15 miles west of Weaverville, respectively. Junction City has an estimated population of 700, and Helena is sparsely populated. Weaverville is located 45 miles west of Redding on SR 299 adjacent to Weaver Creek, a tributary to the Trinity River. It is the largest community in Trinity County with a population of 3,554 in 2000 (U.S. Census Bureau 2005, 2008).

Residential and recreational development is located along the river, along with some agricultural and commercial development. A number of commercial and public recreational developments are located in close proximity to the Remaining Phase 1 and Phase 2 sites.

Existing Land Uses

Existing land uses in and adjacent to the rehabilitation sites are similar. These lands typically support rural residential, recreation, or resource development, and some commercial development upslope from the river. SR 299 parallels the Trinity River in the general vicinity of Douglas City and Junction City, and provides direct access to a number of Remaining Phase 1 and Phase 2 sites.

Historically, gold mining provided the impetus for exploration and development of the various natural resources in the project's general vicinity. While mineral production continues along the Trinity River and its tributaries, the local economy has shifted away from the mining and forest products industries to a recreation and tourism base. Although many of the lands that are adjacent to and in the general vicinity of the Remaining Phase 1 and Phase 2 sites are privately owned, the river is a public waterway and is commonly used for rafting, kayaking, tubing, and fishing.

Local Land Use Planning

Trinity County General Plan

Lands in the project area are located in Trinity County. The Trinity County General Plan applies to privately owned lands in the project area; these lands fall under several of the county's land use designations. General Plan land use designations in the project area include Community Development, Commercial, Resource Lands, Open Space, Rural Residential and Village. The General Plan definitions for each land use designation are listed in Table 4.2-1.

Table 4.2-1. General Plan Land Use Designations within the Remaining Phase 1 and Phase 2 Project Sites

Designation	Definition
Community Development	Community Development identifies those areas in Trinity County that can best be described as viable communities. Special efforts are to be made to positively encourage new development to locate in Community Development areas.
Commercial	Commercial areas are designated within general communities and are intended to indicate the desirable location of various commercial developments. Commercial developments may include community business district, highway commercial, and recreation commercial.
Resource Lands	Resource Lands are those areas designated for producing a variety of natural resources that occur within Trinity County. Natural resources include timber production, mineral production, and important grazing areas.
Open Space	The Open Spaces designation indicates "natural areas" to be protected for scenic, wildlife habitat, and watershed values. These are generally areas of important natural processes and may include unstable areas, floodplains, and other natural hazard areas.

Table 4.2-1. General Plan Land Use Designations within the Remaining Phase 1 and Phase 2 Project Sites

Designation	Definition
Rural Residential	The Rural Residential designation describes areas of rural residential development. Minimal county services are provided and, in general, are undesirable. This designation also provides for small home businesses and small-scale agriculture, subject to controls to prevent nuisances.
Village	Village designates areas intended to contain a wide variety of land uses to serve the needs of the local community.

Source: Trinity County General Plan (2003)

The Trinity County General Plan includes five community plans that provide additional land-use planning guidance (Figure 4.2-2). The project area lies within three of the community plan areas, the Lewiston, Douglas City, and Junction City community plan areas. Community plans typically identify neighborhoods as a way to describe current conditions and guide future development criteria. The following discussion provides information about the relevant community plans and neighborhoods in the Proposed Project area.

Lewiston Community Plan

The Lewiston Community Plan (Trinity County 1986) covers approximately 16 square miles (10,227 acres) centered around the Trinity River from Lewiston Lake to slightly downstream of Grass Valley Creek. There are approximately 7.9 miles of river frontage in the rural community of Lewiston; private lands account for 39 percent of lands bordering the river.

Neighborhoods that are adjacent to the Trinity River include Rush Creek Road, the Community Core, the Historic District, Goose Ranch Road, Salt Flat, Old Lewiston Road, and Bucktail Subdivision. The variety of land uses along the river in Lewiston include commercial, residential, timber resource, agricultural, and open space. These occur at varying densities, which generally reflect available public services and environmental constraints. There is a trend in Lewiston to subdivide parcels, which has resulted in the creation of smaller lots and increased densities. This has led to a slight increase in residential land uses in the Lewiston Community Plan area.

Douglas City Community Plan

The Douglas City Community Plan (Trinity County 1987a) covers approximately 35 square miles (22,400 acres) centered around the Trinity River from slightly downstream of Grass Valley Creek to slightly downstream from Steiner Flat. There are approximately 32.2 miles of river frontage in the rural community of Douglas City; private lands account for 46 percent of the lands bordering the river.

Neighborhoods that are adjacent to the Trinity River include Poker Bar, Steel Bridge Road, Indian Creek, Community Core, and Steiner Flat. Land uses along the river in Douglas City vary by neighborhood and include resource, residential, commercial, village, and open space. These land uses occur at varying densities that generally reflect available public services and environmental constraints.

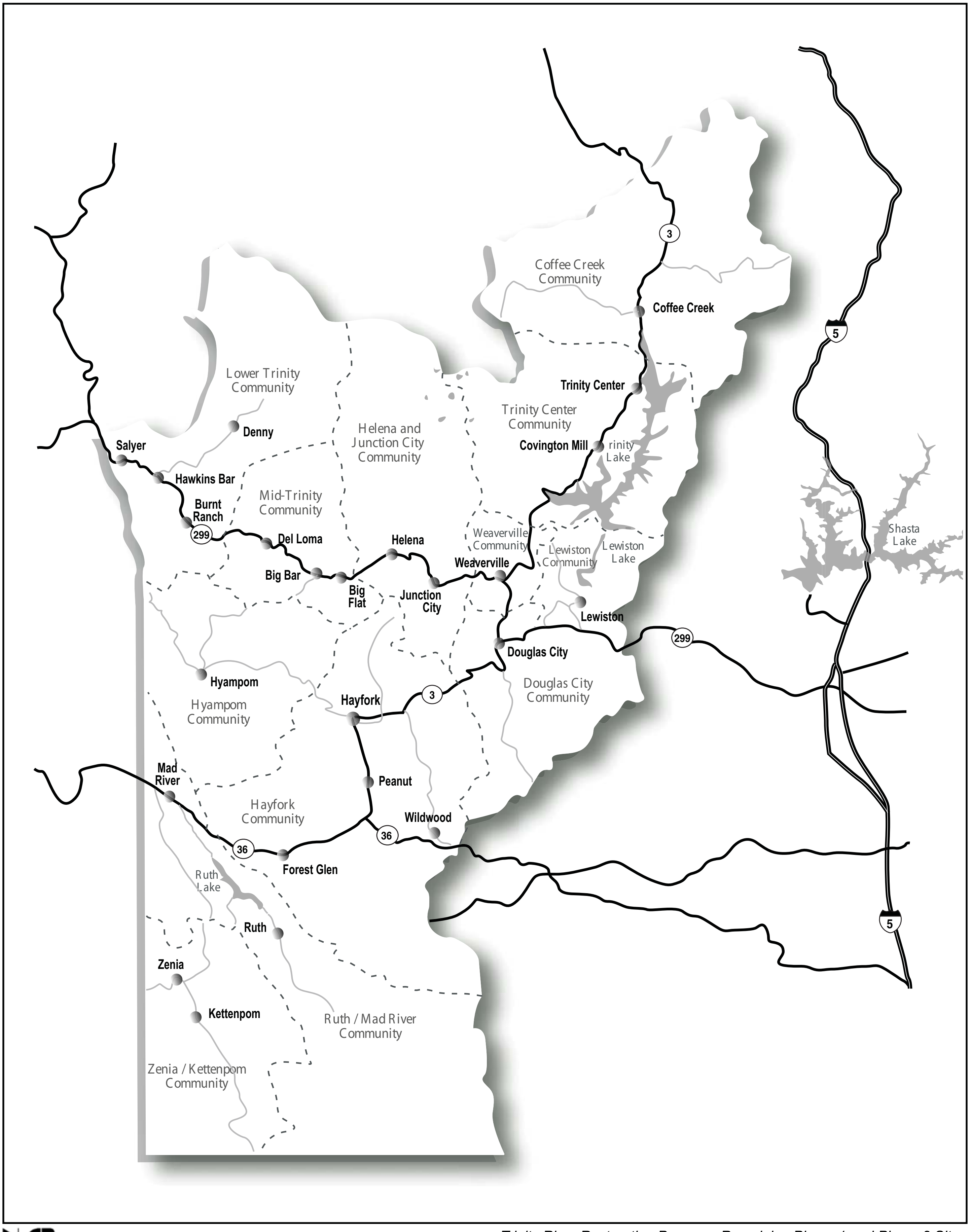

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Figure 4.2-2
Community Planning Area Boundaries

Junction City Community Plan

The Junction City Community Plan (Trinity County 1987b) covers approximately 42 square miles (27,000 acres) centered around the Trinity River from Maxwell Creek to Helena. There are approximately 16.5 miles of river frontage in the rural community of Junction City; private lands account for 36 percent of these lands.

Neighborhoods that are adjacent to the river include Dutch Creek Road, Sky Ranch Road, the Community Core, and Red Hill Road. Land uses along the river in Junction City vary by neighborhood and include resource, agricultural, residential, commercial, village, and open space. These land uses occur at varying densities, which range from 2.5 to 160 acres.

Trinity County Zoning

The Trinity County Zoning Ordinance implements land use goals, objectives, and policies of the General Plan. The Zoning Ordinance establishes land use districts, called zoning districts, to provide specific development requirements and restrictions for land uses in the county. Zoning districts must be consistent with the General Plan land use designations. For example, a parcel that has a Commercial General Plan designation must have some type of commercial zoning district (or a type of zoning district that is deemed compatible with commercial uses). Table 4.2-2 describes land use zoning districts that apply to the project area.

Table 4.2-2. Land Use Zoning Districts for the Rehabilitation Sites

Zones	Description
Agriculture (Ag)	This zoning allows for all agricultural uses; however, some uses require a use permit (e.g., animal feed lots, agricultural processing plants).
Agricultural Forest (AF)	Agricultural Forest districts predate the Timber Production Zone classification, and are intended for the same purpose; land management for the production and harvest of trees or other natural resources.
Timberland Production (TPZ)	Timberland Production is designated on lands suitable for timber production and harvest. This zoning provides property tax benefits by allowing the property value to be based on its use for growing and harvesting timber and compatible uses; it requires preparation of a timber management plan.
Open Space (OS)	The Open Space Zoning District is intended to protect significant or critical wildlife habitat areas or areas that should not be developed due to public health and safety reasons.
Flood Hazard (FH)	Established by the County Floodplain Ordinance (315-698) as an overlay to identify flood hazard areas within Trinity County, the Flood Hazard Zoning District includes areas designated as: (1) Regulatory Floodway or Zone AE on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRM); (2) areas identified as Zone A along the Trinity River or Coffee Creek; (3) along streams in accordance with the Trinity County Subdivision Ordinance; or (4) areas identified as 100-year floodplain in a use permit condition or approved flood study.

Table 4.2-2. Land Use Zoning Districts for the Rehabilitation Sites

Zones	Description
Scenic Conservation (SC)	Scenic Conservation is an overlay zone used to identify those areas of unusual scenic qualities that are unique to Trinity County, and to provide the necessary degree of control on the placement of structures, development of roads, and vegetative management within those areas. Areas lying within the 100-year floodplain of the Trinity River are designated as SC.
Commercial (C-1),(C-2),(HC)	Commercial zones are designated in community development areas and are intended to indicate the desirable location of various commercial developments, including retail business, commercial recreational business, general commercial, and heavy commercial activities. A highway commercial designation is intended for highway-frontage, tourist-oriented business development and for more general commercial uses such as wholesale storage, lumber yard, bulk plants, etc., which require more space than is available in retail commercial and general commercial districts.
Rural Residential (RR-1), (RR-2.5), (RR-5)	Rural Residential allows for limited residential development in outlying areas of the county where minimal impacts are desirable and the overall character of the landscape, as well as potential for open space, recreation, or resource production, is to be preserved. These designations have a minimum parcel size of 1, 2.5, and 5 acres respectively.

Source: Trinity County General Plan (2003)

Table 4.2-2 is an excerpt from the General Plan Land Use Element. It provides a cross-reference of zoning districts that are allowed in each General Plan land use designation (as described in Tables 4.2-1 and 4.2-2). The minimum size required for inclusion of a parcel in a zoning district is also provided in Table 4.2-3.

Table 4.2-3. General Plan Land Use Designations and Allowable Zoning Districts for the Project Sites

Land Use Zoning Districts	General Plan Land Use Designations						Land Use Zoning District Min. Parcel Size (acres)
	Community Develop-ment	Commercial	Resource	Open Space	Rural Residential	Village	
Agriculture	x		x	x			10
Agricultural forest	x		x	x			10
Timber production zone			x	x			20 - 40
Open space	x		x	x			Not specified
Flood hazard				x			Not applicable
Scenic conservation				x			10

Table 4.2-3. General Plan Land Use Designations and Allowable Zoning Districts for the Project Sites

Land Use Zoning Districts	General Plan Land Use Designations						Land Use Zoning District Min. Parcel Size (acres)
	Community Develop-ment	Commercial	Resource	Open Space	Rural Residential	Village	
C-1 retail commercial		x					0.2
C-2 general commercial	x	x					0.2
Highway commercial	x	x					0.2
Rural residential – 1 (1 home/acre)	x				x		1
Rural residential – 2.5 (1 home/2.5 acres)	x				x		2.5
Rural residential – 5 (1 home/5 acres)	x				x		5
Land use designation minimum parcel size (acres)	0.05	0.2	20	N/A	1	0.05	

Source: Trinity County General Plan (2003)

Land Uses Associated with the Rehabilitation Sites

Rehabilitation Sites in the Lewiston Community Plan Area

Five rehabilitation sites are proposed for the Lewiston Community Plan area. Two sites (SM and UR) would be located between the Rush Creek Road and Goose Ranch Road neighborhoods; one site (LRC) would be located between the Goose Ranch Road and Salt Flat neighborhoods; and two sites (LR and THG) would be located in the Old Lewiston Road neighborhood. The LR site would also abut the Bucktail Subdivision at the site's eastern edge.

Land use designations in these neighborhoods are a mixture of Rural Residential, Resource, and Open Space. In addition, commercial land use is present in the Rush Creek neighborhood, and agricultural land uses are present in the Old Lewiston Road neighborhood (Trinity County 1986). Public and private fishing and river access areas occur within the neighborhoods and throughout the rehabilitation sites.

The locations of the Remaining Phase 1 and Phase 2 sites (within and adjacent to the Trinity River) place a significant portion of the sites in the 100-year floodplain as designated by the Federal Emergency Management Agency (FEMA) (see Figure 4.4-2 in section 4.4, Water Resources). The Remaining Phase 1 and Phase 2 sites are located in Zone X500,[1] Zone X[2], and Zone A[3], as designated by FEMA. In

[1] Zone X500 is an area between the 100- and 500-year flood zone.

addition, all lands located in the 100-year floodplain of the Trinity River have been designated by Trinity County as Scenic Conservation Zones.

Portions of some sites in the Lewiston Community Plan area are located on federal and state lands. These include lands managed by Reclamation, BLM, DWR, and CDFG (Figure 4.2-3).

Rehabilitation Sites in the Douglas City Community Plan Area

Twelve rehabilitation sites are proposed for the Douglas City Community Plan area; two of these are Remaining Phase 1 sites, and 10 are Phase 2 sites. Three sites (TLG, PB and CG) would be located in the Poker Bar neighborhood; three sites (LKG, SB, and MG) would be located in the Steel Bridge Road neighborhood; one site (DCY) would be located in the Community Core neighborhood; one site (RC) would be located immediately adjacent to the Community Core; and four sites (SFF, SFC, LSF and LZG) would be located in the Steiner Flat neighborhood.

The neighborhoods in which these sites are located are primarily riverbank communities with Rural Residential, Village, Open Space, and Resource land use designations. Public and private fishing and river access areas occur within the neighborhoods and throughout the rehabilitation sites.

Significant portions of the Remaining Phase 1 and Phase 2 project sites are located in the 100-year floodplain of the Trinity River, as determined by FEMA. The areas in the 100-year floodplain have been designated as Zone A, Zone X, and Zone X500 Flood Hazard Areas (see Figure 4.4-2 in section 4.4, Water Resources). As noted above, all sites in the 100-year floodplain of the Trinity River have been designated by Trinity County as Scenic Conservation Zones.

Some sites in the Douglas City Community Plan area are located on federal lands. These include lands managed by BLM and STNF (Figure 4.2-3).

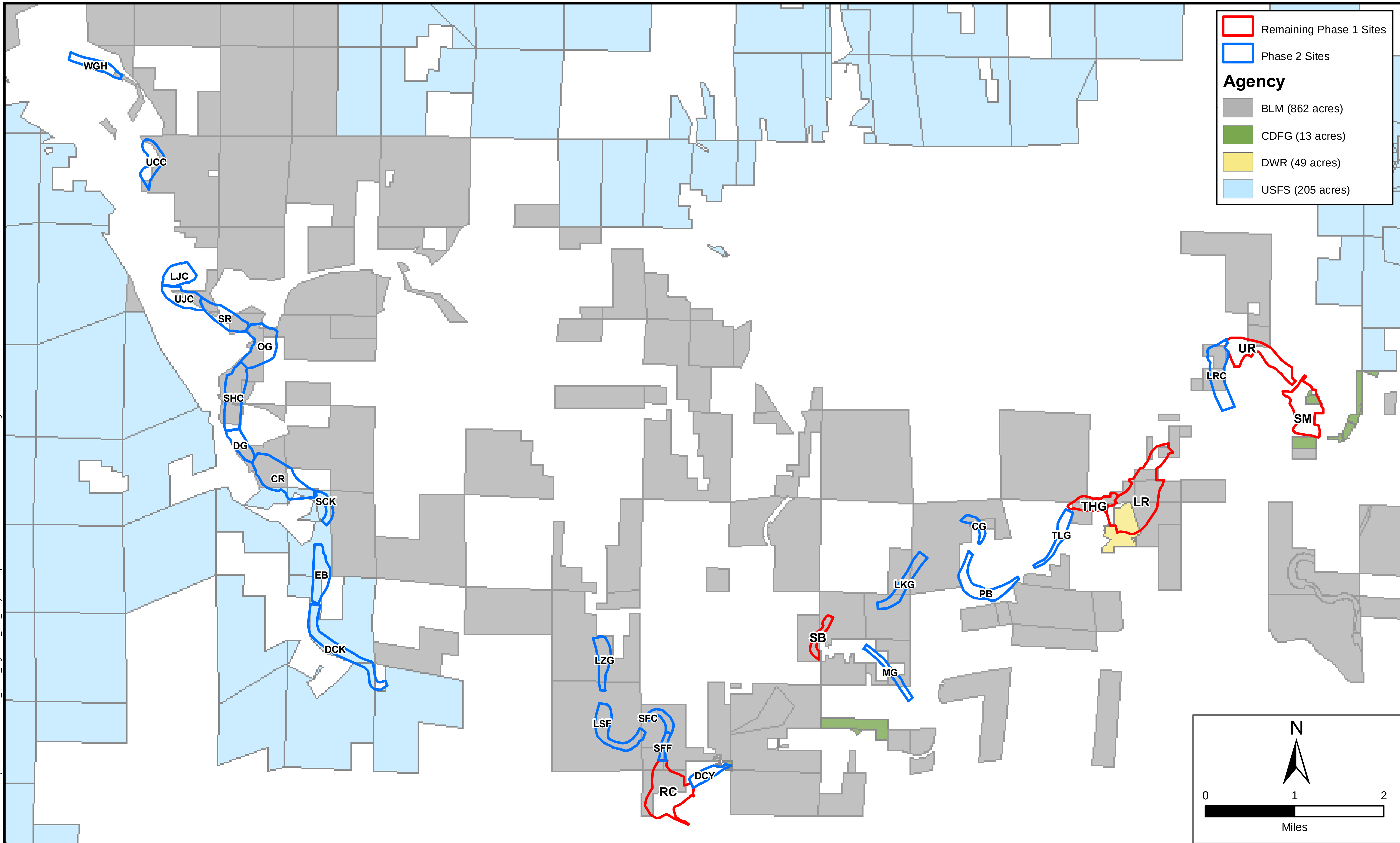
Rehabilitation Sites in the Junction City Community Plan Area

There are no Remaining Phase 1 sites within the Junction City Community Plan area. Twelve Phase 2 sites are proposed for the Junction City Community Plan area. Two sites (DCK and EB) would be located at the south end of the Dutch Creek Road neighborhood; six sites (SCK, CR and DG, SHC, OG, and SR) would be located between the Dutch Creek Road and Sky Ranch Road neighborhoods; one site (UJC) would be located between the Community Core and Dutch Creek Road neighborhoods; one site (LJC) would be located between the Community Core and the Red Hill Road neighborhoods; and two sites (UCC and WGH) would be located adjacent to the Red Hill Road neighborhood.

Land use designations in these neighborhoods are typical of the community plan area, primarily Rural Residential, Open Space, and Resource designations, with a small area in the Community Core neighborhood designated as Village. The south end of the Dutch Creek Road and Sky Ranch Road

[2] Zone X is an area inundated by 100-year flooding with average depths of less than one foot, or with drainage areas less than one square mile, or areas protected by levees from a 100-year flood event.

[3] Zone A is an area inundated by 100-year flooding for which no BFE has been determined.



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North State Resources, Inc.

Trinity River Restoration Program: Phase 1 and Phase 2 Sites

Figure 4.2-3
TRRP Project Sites – Public Lands – Federal and State Agencies

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neighborhoods are predominantly large Resource parcels between 20 and 40 acres. The north end of these neighborhoods support Rural Residential development with parcels typically ranging from 4 to 15 acres. The majority of parcels in the Red Hill neighborhood fall in the Rural Residential designation. There are several commercial establishments in the Community Core (Trinity County 1987b).

Significant portions of the Phase 2 project sites are located in the 100-year floodplain of the Trinity River as determined by FEMA. The sites in the 100-year floodplain have been designated as Zone A, Zone X, and Zone X500 Flood Hazard Areas. As noted above, all sites in the 100-year floodplain of the Trinity River have been designated by Trinity County as Scenic Conservation Zones.

Portions of some sites in the Junction City Community Plan area are located on federal lands. These include lands managed by BLM and the STNF (Figure 4.2-3).

Proposed Land Uses

In general, parcels within the rehabilitation site boundaries have been subdivided to the fullest extent possible under existing zoning designations; therefore, future rural residential development on the uplands above the river's floodplain would be minimal. Future development is restricted by the proximity of the parcels to the Trinity River; many of these parcels are currently zoned Flood Hazard and Open Space.

Sensitive Receptors

A sensitive receptor is a location where human populations—particularly children, seniors, and sick individuals—are present and where there is a reasonable expectation of human exposure to pollutants. The project is not located near a hospital or senior housing. However, portions of the project would be located near elementary schools, adjacent to residential areas, and adjacent to outdoor recreation areas.

Project activities would be located about a half mile from the Lewiston Elementary School, less than a quarter mile from the Douglas City Elementary School, and less than 300 feet from the Junction City Elementary School. Several day use areas along the river would be in or adjacent to rehabilitation sites in Douglas City and Junction City; these sites include SB, DCY, SFF, SFC, LSF, LZG, and the DCK. Campgrounds along the river that would be in or adjacent to rehabilitation sites include the Trinity River Lodge (private), the Douglas City campground, and the Junction City campgrounds. Many residences are located in or adjacent to the project sites in each of the communities. The majority of residences in the Proposed Project area are located upslope and away from the Proposed Project activities; however, some residences are located in close proximity to proposed staging and construction activities.

4.2.2 Relevant Land Use Plans

Federal

Bureau of Land Management Redding Resource Management Plan and Record of Decision (ROD)

BLM's Redding Resource Management Plan (RMP) (U.S. Bureau of Land Management 1993) provides guidance for BLM land use management activities in the project area. Resource Condition Objectives, Land-Use Allocations, and Management Actions provide specific land use direction. Resource Condition Objectives are the goals established for the decision area and are listed in descending order of priority. Land-Use Allocations prescribe general management categories (e.g., visual resources and recreation opportunity classes), specific limitations to full resource use (e.g., leasable mineral restrictions), or formal designations (e.g., Area of Critical Environmental Concern, wild and scenic river corridor) that are needed to meet the Resource Condition Objectives and/or to comply with federal law. Management actions are implementation measures that ensure that the Resource Condition Objectives are met and that alert the public and BLM to specific follow-up actions associated with specific land-use management alternatives. The following land use and planning directives apply to the Proposed Project.

Resource Condition Objectives

1. Enhance recreation opportunities related to use of the Trinity River, including mineral collection.

2. Maintain scenic quality along the river corridor.

3. Protect and enhance the anadromous fisheries of the Trinity River.

4. Interpret and protect key cultural and natural resources for the public.

5. Maintain the riparian habitat in Class I or Class II [Visual Resource Management] condition.

6. Consolidate and increase, as feasible, public ownership within areas of low intensity or undeveloped land uses that constitute the designated river corridor.

7. Maintain opportunities for the exploration and the production of locatable mineral values outside the protected areas.

8. Provide enhanced access for semi-primitive motorized recreation opportunities and to Native American Indian heritage resources.

9. Maintain the existing scenic quality of BLM-administered lands.

Land Use Allocations

1. Designate [public lands in the management area] as the corridor for this "Recreational" component of the National Wild and Scenic Rivers System.

2. Manage all public lands as Visual Resource Management[4] (VRM) Class II (i.e., retain the existing character of the landscape).

3. Manage all public lands within the corridor as Roaded Natural or Semi-Primitive Motorized.

[4] A two-stage system (inventory and analysis) used by the BLM to minimize the visual impacts of surface-disturbing activities to scenic public lands and to maintain scenic values for the future.

4. Withdraw specific cultural resources from mineral entry. Withdraw anadromous fisheries habitat improvements from mineral entry.

5. Offer mineral material disposals only to enhance riparian vegetation or anadromous fisheries habitat, or when not in conflict with the long-term protection of natural values.

6. Maintain existing Recreation Opportunity Spectrum classes.

7. Mineral material disposals are not allowed within the 100-year floodplain of anadromous fishery streams unless such actions enhance anadromous fisheries habitat.

8. Consolidate and increase public land ownership within the area by acquiring available unimproved lands that adjoin the Trinity River Corridor; protect anadromous fish; provide public access to public lands; protect sensitive species habitat; conserve regionally important cultural resources; provide access to identified Native American heritage resources; or enhance overall efficiency of public land administration.

Management Actions

1. Modify the existing Trinity River Recreation Area Management Plan (U.S. Bureau of Land Management 1983) to reflect the designated corridor of the Trinity River (i.e., a “Recreational” component of the National Wild and Scenic Rivers System).

2. Continue implementation of recreational developments and monitoring prescribed in the existing management plan.

For projects upstream of Helena on the Trinity River, BLM is responsible for ensuring that the scenic values of public lands are considered before allowing uses that may have negative visual impacts. BLM developed a Visual Resource Management system (VRM) to maintain the scenic value of the public lands. Public lands in the Trinity River corridor are managed to meet the following VRM Class II objective: “to retain the existing character of the landscape. The level of change to the characteristic landscape should be low.” Therefore, management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape (U.S. Bureau of Land Management 2007).

A Record of Decision (ROD) signed by the Secretaries of Interior and Agriculture in 1994 amended Forest Service and BLM Planning Documents within the range of the Northern Spotted Owl (U.S. Department of Agriculture and U.S. Department of the Interior 1994). A key component of the decision was the implementation of Standards and Guidelines for management of habitat for late-successional species within the range of the northern spotted owl.

In addition to resource objectives and land allocations described in the following paragraphs, BLM’s RMP requires compliance with the Aquatic Conservation Strategy (ACS) contained in the ROD. This strategy contains four components: riparian reserves, key watersheds, watershed analysis, and watershed restoration. The authorization of a project on lands managed under BLM's RMP requires a consistency determination with the RMP and the ACS. The supporting documentation for the ACS consistency determination is provided as Appendix A of this document. The supporting documentation for the RMP consistency determination is provided below.

Table 4.2-4 shows the consistency of the project action(s) with BLM's Redding RMP and ROD (1993).

Table 4.2-4. Consistency of Proposed Action and Alternatives with BLM's Redding Resource Management Plan and the 1993 Record of Decision

Objectives	Assessment of Consistency
1. Enhance recreation opportunities related to use of the Trinity River including mineral collection.	Rehabilitation activities would protect or improve existing recreation opportunities (e.g., fishing and boating access to BLM-managed lands) along the Trinity River.
2. Maintain scenic quality along the river corridor.	Rehabilitation activities would not add any new, visually detracting features to the river corridor.
3. Protect and enhance the anadromous fisheries of the Trinity River.	Rehabilitation activities would protect and enhance the anadromous fisheries of the Trinity River (see Section 4.6, Fishery Resources).
4. Interpret and protect key cultural and natural resources for the public.	Rehabilitation activities would protect existing cultural and natural resources (see Section 4.7, Vegetation, Wildlife, and Wetlands; and Section 4.10, Cultural Resources).
5. Maintain the riparian habitat in Class I or Class II condition.	The overall goal of the Proposed Project is to rehabilitate the Trinity River, including its fisheries. Riparian habitat removed by Phase 2 and Remaining Phase 1 activities would be replaced with a more diverse and historic assemblage of native plants (see Section 4.7 and Appendix B, Wild and Scenic River Act Section 7 Determination).
6. Consolidate and increase, as feasible, public ownership within areas of low intensity or undeveloped land uses that constitute the designated river corridor.	Rehabilitation activities would not require any changes in land ownership. A large portion of the affected lands are under public ownership.
7. Maintain opportunities for the exploration and the production of locatable mineral values outside the protected areas.	Rehabilitation activities would not interfere with long-term mineral exploration or extraction. However during construction, access for mineral exploration and extraction at specific sites may be limited.

Table 4.2-4. Consistency of Proposed Action and Alternatives with BLM's Redding Resource Management Plan and the 1993 Record of Decision

Objectives	Assessment of Consistency
8. Provide enhanced access for semi-primitive motorized recreation opportunities and to Native American Indian heritage resources.	Rehabilitation activities would be confined primarily to the river channel and riverbanks. Although several access roads would be created within the Phase 2 and Remaining Phase 1 sites, most of these roads would be decommissioned once rehabilitation activities are completed to minimize impacts. Rehabilitation activities would protect existing cultural and natural resources (see Section 4.7, Vegetation, Wildlife, and Wetlands; and Section 4.10, Cultural Resources).
9. Maintain the existing scenic quality of BLM-administered lands.	Rehabilitation activities would not add any new, visually detracting features to the river corridor.

Shasta-Trinity National Forest Land and Resource Management Plan

Land use planning direction for the Shasta-Trinity National Forest (STNF) is guided by national legislation, regional forest directives, and forest-specific management directives found in the STNF Land and Resource Management Plan (LRMP). The STNF LRMP is based on three broad management strategies: preservation, biodiversity, and sustainable development for people. Resources are categorized by type (such as air resources, fisheries, lands, etc.) and assigned management goals, standards, and guidelines.

There are six broad categories of land use that apply to the STNF: Congressionally Reserved Areas, Late Successional Reserves, Administratively Withdrawn Areas, Riparian Reserves, Matrix, and Adaptive Management Areas (U.S. Forest Service 1995). All but Congressionally Reserved Areas are present in the Weaverville/Lewiston Management Area and the Trinity River Management Area of the STNF. The LRMP requires that land uses be managed in accordance with standards and guidelines. Lands designated as Riparian Reserve, for example, have specific management standards and guidelines for air quality, biological diversity, fire and fuels, etc. The following describes the five land use allocations applicable to the Proposed Project and their management prescriptions:

- **Late Successional Reserves:** These have been established to protect and enhance conditions of late-successional and old-growth forest ecosystems and to ensure the support of related species, including the northern spotted owl. The applicable management prescription is:
  - Provide special management for Late Successional Reserves and threatened and endangered species. The management prescription includes special, selected sensitive wildlife species that are primarily dependent on late seral stage conditions.

- **Administratively Withdrawn Areas**: These are identified in the LRMP and include recreation and visual areas, backcountry, and other areas where management emphasis precludes scheduled timber harvesting. The applicable management prescriptions are:
    - *Unroaded Non-Motorized Recreation*: Provide for semi-primitive non-motorized recreation opportunities in unroaded areas outside existing wildernesses while maintaining predominantly natural-appearing areas with only subtle modifications.
    - *Limited Roaded Motorized Recreation*: Provide for semi-primitive motorized recreation opportunities while maintaining predominantly natural-appearing areas with some modifications.
    - *Roaded, High Density Recreation*: Provide areas which are characterized by a substantially modified natural environment.
    - *Special Area Management*: Provide for protection and management of special interest areas (SIAs) and research natural areas (RNAs).
    - *Heritage Resource Management:* The primary theme of this prescription is to protect designated cultural resource values, interpret significant archaeological and historical values for the public and encourage scientific research of these selected properties.
- **Riparian Reserves**: Provide an area along streams, wetlands, ponds, lakes, and unstable and potentially unstable areas where riparian-dependent resources receive primary emphasis. The applicable management prescription is:
    - Maintain or enhance riparian areas, wildlife and fisheries habitat, and water quality by emphasizing streamside and wetland management.
- **Matrix**: Includes federal lands outside the categories of designated areas listed above. Matrix lands are where most timber harvest would occur and where standards and guidelines are in place to ensure appropriate conservation of ecosystems as well as provide habitat for rare and lesser known species. The applicable management prescriptions are:
    - *Roaded Recreation*: Provide for an area where there are moderate evidences of the sights and sounds of humans.
    - *Wildlife Habitat Management*: The primary purpose of this prescription is to maintain and enhance big game, small game, upland game bird, and non-game habitat, to provide adequate hunting and viewing opportunities.
- **Adaptive Management Areas**: Manage lands on an ecosystem basis in terms of both technical and social challenges, and in a manner consistent with applicable laws. There are no management prescriptions associated with Adaptive Management Areas.

Standards and Guidelines (LRMP, pp. 4-19 through 4-24)

The LRMP does not specifically identify land use goals. However, the following standards and guidelines that pertain to special uses such as fisheries are relevant to land use and planning. The standards and guidelines were excerpted from the LRMP (U.S. Forest Service 1995).

- Coordinate instream flow needs with the CDFG, counties, and other local agencies to benefit fish habitat.
- Improve the anadromous fishery within the Trinity River and its tributaries. This can be done by evaluating the implementing opportunities for stream habitat improvement, watershed restoration, and biological (stock) enhancement. This will be done in the context of a watershed/ecosystem analysis. These projects will be done in conjunction with the Trinity River Basin Fish and Wildlife Management Program.[5]
- Coordinate rehabilitation and enhancement projects with cooperating agencies involved in the Model Steelhead Stream Demonstration Project Plan and the Trinity River Basin Fish and Wildlife Management Program.
- Identify and treat riparian areas that are in a degraded condition.
- Manage activities and projects to meet adopted Visual Quality Objectives (VQOs) of: (1) preservation; (2) retention; (3) partial retention; (4) modification; or (5) maximum modification. On rare occasions, the adopted VQO may not meet the management objectives (i.e., catastrophic events). Any proposed modification to adopted VQOs must go through the NEPA process and be approved by the Forest Supervisor.
- In the following sensitive travel corridors [along the Trinity Heritage National Scenic Byway within the Weaverville/Lewiston Management Unit] the foreground portions (areas located from 1/4 to 1/2 mile from the road viewer) will be managed primarily to meet the adopted VQO of Partial Retention:
    - Rush Creek Road (County Road 204), and
    - Trinity Dam Boulevard (County Road 105).
- Implement habitat management activities for the winter deer range and the anadromous fishery where opportunities exist.
- Manage developed recreation sites according to designated ROS [Recreation Opportunity Spectrum] classes.

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[5] The Trinity River Basin Fish and Wildlife Management Program was superseded by the 2000 Trinity River Mainstem Fisheries Restoration Program ROD and the advent of the TRRP.

- Provide barrier free recreation facilities that are accessible to physically challenged individuals. Emphasize these facilities at urban interface and other developed recreation locations.

- Prepare objectives and prescriptions for managing vegetation in and around developed recreation sites.

- Provide interpretive services to direct visitors to their recreation destinations, to facilitate understanding of resource management activity, and to acquaint them with unique or special features on the STNF and the function of forest ecosystems.

- Continue to improve access to rivers, streams, and lakes for water-oriented recreation activities consistent with the LRMP. Continue to provide access to hunting, fishing, and wildlife viewing areas.

- Promote partnerships with user groups to assist in the operation, maintenance, and development of recreation sites and facilities.

- Encourage the private sector to help provide needed recreation sites, facilities, and services with a development level consistent with the environmental setting and appropriate studies.

Management Guide for the Shasta and Trinity Units of the Whiskeytown-Shasta-Trinity National Recreation Area

The Management Guide for the Whiskeytown-Shasta-Trinity NRA contains management strategies intended to achieve or maintain a desired condition. These strategies take into account opportunities, management recommendations for specific projects, and mitigation measures needed to achieve specific goals. The following strategies related to recreation issues associated with the project area are excerpted from the Management Guide (USDA Forest Service 1996).

<u>Recreation: Land Based (Management Guide pp. IV-7 through IV-8):</u>

- All interpretive signing within the NRA will be coordinated between Recreation and other resource program areas to insure consistency in message and presentation. Applicable recommendations from the NRA Interpretive Plan will be incorporated as opportunities arise.

- Emphasis will be given to maintenance and replacement of directional signs with the NRA.

- Bear management in NRA recreational facilities will include the provision of bear-proof facilities, such as dumpsters and food lockers in high bear concentration areas, an active education/signing program, and coordination with California Department of Fish and Game (CDFG).

- All design opportunities to develop or improve recreation facilities will take into consideration higher development level needs of RV users and accessibility for disabled.

As discussed above, a ROD signed in 1994 by the Secretaries of Interior and Agriculture amended Forest Service and BLM Planning Documents within the range of the northern spotted owl (U.S. Department of Agriculture and U.S. Department of the Interior 1994). In addition to the land allocations described in the preceding paragraphs, the STNF LRMP requires compliance with the ACS contained in the ROD. The authorization of a project on lands managed under the STNF LRMP requires a consistency determination with the ACS contained in the ROD. The supporting documentation for this determination is provided as Appendix A to this document.

U.S. Bureau of Reclamation

The Central Valley Project Improvement Act of 1992 (CVPIA) provides the legal authority for projects that restore the fishery resources of the Trinity River. This act includes language intended to require the federal government to preserve, propagate, protect, restore, and enhance fish, wildlife, and associated habitats within the Trinity River basin. Reclamation's TRRP office in Weaverville is charged with implementation of the 2000 Trinity River Mainstem Fisheries Restoration Program ROD including rehabilitation site design and construction; Reclamation is the proponent for the Proposed Project.

State

California Department of Fish and Game

The CDFG manages several parcels of land along the Trinity River between the Lewiston Bridge and Bucktail Bridge. Because fish and wildlife protection and habitat enhancement are CDFG's primary management responsibilities, and because so many of the recreational opportunities along the Trinity River center on fish and wildlife resources, CDFG manages its lands for fish and wildlife, habitat improvement, and enforcement of the Fish and Game Code and wildlife area restrictions and regulations.

California Department of Water Resources

The DWR manages 90 acres of land along the Trinity River and Grass Valley Creek in Lewiston at the site of the historic Lowden Ranch. In an effort to restore Trinity River fisheries, DWR purchased land at the mouth of Grass Valley Creek, a major sediment contributor, to construct sediment control ponds and to store sediment removed from the ponds. The Hamilton Ranch Management Plan (1994) provides land use guidance for this 90-acre parcel at the mouth of Grass Valley Creek.

Local

Trinity County General Plan

The Trinity County General Plan (Trinity County 2003) contains goals, objectives, and policies designed to guide the future physical development of the county based on current conditions. The General Plan, which applies to the entire county, includes community plans for Lewiston (Trinity County 1986), Douglas City (Trinity County 1987a), and Junction City (Trinity County 1987b).

One way in which the General Plan goals, objectives, and policies are implemented is through land use designations. Specific land use designations dictate the types of land uses that may occur on a specific parcel. The general objectives of these land use designations are shown in Table 4.2-1.

The following goals, objectives, and policies related to land use and planning are applicable to the proposed project; these goals, objectives, and policies were excerpted from relevant elements of the Trinity County General Plan.

Land Use Element

Among the goals, objectives, and policies of the Land Use Element, the following are applicable to the Proposed Project:

to retain the rural character of Trinity County by:

- encouraging uses that fit with the land
- considering the “rights” of the individual when making decisions as well as the “rights” of the community
- seeking information and cooperation from state and federal agencies within Trinity County when considering projects

to strive to conserve those resources of the county that are important to its character and economic well-being by:

- assuring that developments occurring on these lands are compatible with the resources
- strongly supporting the county as “lead agency” or as an integral participant in any state or federal project within the county so that all agencies are made aware of local desires and all plans are coordinated
- utilizing a sound resource-related planning process in decision-making
- protecting not only rare and endangered species, but also required habitat for more plentiful species

to encourage adequate housing and residential space to keep pace with a moderate population growth by:

- avoiding the need for increased public services
- keeping density, and thus demand, as low as possible in the most rural areas
- determining “threshold” densities that require expensive public services

to maintain and enhance a viable economic base for Trinity County by:

- maintaining as many privately owned prime timber, agricultural, mineral, sport and commercial fishery, and animal-producing lands as possible

- encouraging tourism
- implementing the General Plan so that it is applied fairly and consistently and by stabilizing land-use regulations

Safety Element

Among the goals, objectives, and policies of the Safety Element related to land use and planning, the following is applicable to the Proposed Project:

Reduce hazards in Trinity County resulting from floods:

- Reduce loss of life and property by establishing development standards for areas subject to flooding.
- Reduce the potential for the loss of life and property from dam failure inundation.

Reduce the threat to life and property from seismic and geologic hazards:

- Geologic hazards and seismic safety shall be considered in the preparation of environmental documents as required by CEQA.
- The County shall confirm that all construction and grading activities done will not adversely affect the stability of any slope.

Continue to maintain a high standard of air quality in Trinity County:

- Ensure burning projects will not diminish air quality.
- The burning of any material shall comply with burning permits, conditions and/or standards established by the NCUAQMD.

Reduce threats to the public and the environment caused by the use, storage, and transportation of hazardous materials and hazardous waste:

- Ensure proper regulation of transportation and storage
- Ensure adequate cleanup of hazardous materials and hazardous waste.
- Ensure water quality.

Reduce fire hazards in wildland, wildland/urban interface, and developed areas:

- Ensure emergency accessibility to development through proper road construction and signage.

- Reduce potential fire activity through fuels reduction programs.

Open Space and Conservation Elements

Among the goals, objectives, and policies of the Open Space and Conservation Elements related to land use and planning, the following are applicable to the Proposed Project:

Preserve and maintain open space as a means of providing and preserving natural habitat for all species of wildlife:

- Maintain all species of fish and wildlife for their intrinsic and ecological values as well as for their direct benefit to mankind.
- Provide for diversified recreational use of fish and wildlife.
- Any plans to alter the present environment should be considered on the basis of protecting fish and wildlife and their habitat.
- Present land uses which result in siltation and pollution of lakes and streams should be carefully monitored, and if necessary, corrected to assure a clean and productive habitat.
- Encourage development and enhancement of wildlife habitat through careful use of methods such as controlled burning, planting, water development, judicious livestock grazing, and mechanical land manipulation.
- Retain and develop access to public areas very carefully through riding and hiking trails.

Protect the scenic natural resources of Trinity County and preserve areas which are important commercial natural resources for future generations:

- Conserve lands that provide viable natural mineral deposits for potential use.
- Preserve areas of natural scenic beauty as areas of active and passive recreation.
- Provide for a diversified recreational use of fish and wildlife while conserving and preserving their habitat.

Preserve the quantity and quality of the existing water supply in Trinity County and adequately plan for the expansion and retention of valuable water supplies for future generations:

- Disapprove of any developments that may pollute the existing streams and lakes or become a source of silt that washes down into water areas.

Retain the character and natural beauty of Trinity County with the preservation of existing open space and the control of open space:

- Protect stream-banks and lakeshores from undesirable development.
- Define and establish the use of primary floodplain areas as open space.

Conserve, preserve and maintain the habitat for wildlife species, plant life and the environment by:

- planning for mineral production and performance so as to avoid destruction, pollution or degradation of surrounding land, water and air resources. After mineral extraction has been completed, land used for mineral production should be revegetated and restored to its natural condition.
- identifying all geologic and soil areas and developing standards for restricted development of any hazard areas.

To reserve land for recreational facilities, encourage private recreational development and other open uses in categories characteristic and beneficial to the present and future residents of Trinity County without damage to the ecology of the area as well as to meet the tourist needs of the immediate future and the long range future.

- Recreational resources on public and private lands should be protected for the future as these resources are largely irreplaceable natural assets.
- Recreation to serve regional and state-wide residents should be encouraged on public lands in Trinity County.
- Provisions should be made for an adequate number of campsites, overnight camping facilities, scenic turnouts, picnic areas and roadside rests for the projected day visitors in the county.
- Retain the character and natural beauty of Trinity County with the preservation of existing open space and the control of open space by encouraging recreational facilities which will provide open space at all government levels.

Retain and develop access to public areas very carefully through riding and hiking trails (non-motorized).

Recreation development, second home development or extension of urban areas must be guided in several directions. It is necessary to:

- protect the physical environment, which now means that we must return it to its natural state insofar as possible and practical.
- ensure the most effective and beneficial use of land and its natural resources.

Retain the character and natural beauty of Trinity County by sound conservation practices.

Encourage recreational facilities which will provide open space at all government levels.

Conserve, preserve, and maintain the scenic beauty of Trinity County by:

- acquiring scenic easements for conservation of Trinity County's scenic beauty.
- controlling encroachment of cut and fill slopes into scenic easement areas or corridors along scenic highways, whether these highways are State or County.

Housing Element

Among the goals, objectives, and policies of the Housing Element related to land use and planning, the following are applicable to the Proposed Project:

Provide more diverse sources of income and stabilize the economy.

Provide a higher average in income levels.

Provide an adequate supply of sound affordable housing units in a safe and pleasant environment that enhance community quality of life for the present and future residents of the County, regardless of race, age, religion, sex, marital status, ethnic background, or disabilities by implementing the following policies:

- Ensure there are an adequate number of housing units to meet the needs of its citizens.
- Ensure that there are housing units to serve persons with special housing needs.
- Support community efforts and citizens in need of short-term emergency housing.
- Ensure environmental justice is adhered to in the process of providing housing.

Noise Element

Among the goals, objectives, and policies of the Noise Element related to land use and planning, the following are applicable to the Proposed Project:

- Protect citizens of the county from the harmful and annoying effects of exposure to excessive noise.
- Preserve the tranquility of residential areas by preventing noise-producing uses from encroaching upon existing or planned noise-sensitive uses.
- Noise created by new transportation noise sources shall be mitigated so that resulting noise levels do not exceed the [county noise] standards at noise sensitive land uses.

- The county shall review new public and private development proposals to determine conformance with policies in [the] Noise Element.

- The county shall require an acoustical analysis in those cases where a project potentially threatens to expose existing or proposed noise sensitive land uses to excessive noise levels. The presumption of potentially excessive noise levels shall be based on the location of new noise-sensitive uses to known noise sources, or staff's professional judgment that a potential adverse noise impact exists.

- It must be realized that although noise is not a health problem in Trinity County, it is a major annoyance in some areas and should be abated, when feasible, to the benefit of everyone.

Community Plans

The Lewiston, Douglas City, and Junction City community plans have similar goals, objectives, and policies related to land use and planning. Among the goals, objectives, and policies of these community plans related to land use and planning, the following are applicable to the Proposed Project:

Provide a variety of land use types and residential densities within the Plan area.

Encourage development that is consistent with the natural carrying capacity of the area's soil.

Discourage road building activities on identified unstable or slide prone areas.

Retain the quiet unobtrusive nature of development in the Plan area:

- Review future development proposals for excessive noise impacts.

Maintain the identity of existing neighborhood areas by ensuring that future public improvements do not significantly infringe upon the characteristics of existing neighborhoods.

Encourage the retention of and utilization of resource land for timber production, agricultural uses, and mineral extraction:

- Encourage mineral extraction activities, especially gravel extraction uses, within the Trinity River.

- Protect resource areas from encroachment by incompatible uses.

Encourage the sound use of mineral resources, especially sand and gravel operations, which reduce sedimentation of the river.

Protect public and private developments from flood hazards:

- Ensure that future developments do not create flood hazards either to themselves or to downstream developments.

Deter development away from unstable slopes or soils:

- Discourage development activities on fault zones and landslide areas.
- Ensure that existing development activities in unstable areas are monitored and stabilized.

Coordinate review of private and public developments with the Natural Resources Conservation Service.

Protect areas of special habitat considerations within the plan area by:

- encouraging retention of riparian habitat areas.
- working with property owners adjacent to the Trinity River to retain existing riparian vegetation.

Protect and improve fish habitat within the plan area by:

- encouraging the development of stream restoration projects within the plan area.

Preserve and maintain open space as a means of providing habitat for all species of wildlife:

- Retain open space for habitat uses.
- Protect floodplain areas from intensive development that could lead to adverse impacts to wildlife.
- Achieve a balance between development and maintenance of open space for critical deer winter range.
- Preserve and protect special habitats areas, such as mineral springs, and snags used by bald eagles and other raptors.
- Review future development to ensure protection of significant habitat areas (other than critical winter range).

Encourage recreation development as a viable sector of the local economy:

- Further develop and expand recreation developments along Rush Creek Road in order to provide for additional tourist camping facilities.

- Develop existing publicly owned access areas to the river to meet the needs of visitors to the area.

Provide for access to the Trinity River in a manner which recognizes and respects the rights of existing development.

- Ensure that the proper level of services is provided at river access points.
- Ensure that future access areas or sites are designed and located so as to avoid potential conflicts with private development.
- Continue to monitor recreational use of the river to ensure that additional use or access does not result in degradation of the river environment.

Provide more diverse sources of income and stabilize the local economy.

Provide for the economic viability of existing businesses which serve community residents:

- Recognize and encourage, as a priority, the small business activities located throughout the Plan area.
- Ensure that state, federal, or county projects provide every opportunity for small contractors to favorably compete against large contractors.

Encourage the preservation of historical structures within the Plan area:

- Provide for flexibility in land development standards so that retention and rehabilitation of historical structures is encouraged.

Retain and enhance the overall high visual quality of the Plan area by:

- designating portions of Trinity Dam Boulevard, Buckeye Creek Road, and Rush Creek Road as Scenic Roadways.
- reviewing future development within a quarter mile of the Trinity River for impact on the visual qualities on the Trinity River.

Provide an adequate level of fire protection services to resource lands:

- Encourage the continued cooperation of fire services providers servicing the Plan area.

Maintain as a priority the existing level of public services and improvements within areas of the community already served:

- Coordinate road improvements and maintenance activities with the Community Service District[s] to ensure all season access to existing and future fire stations.

- Ensure that new development does not reduce the level of existing services.

Coordinate the transportation and circulation system with planned uses:

- Coordinate public agency development of river access points and trails with their circulation systems.

- Concentrate heavy traffic generators on major roads.

- Provide a roadway system that effectively, efficiently and safely serves transportation needs.

- Improve the safety characteristics of identified roadways based upon average daily traffic and public safety requirements.

- Improve Browns Mountain Road from Lewiston Road to the Trinity River to a consistent width.

Trinity County Zoning Ordinance

The Trinity County Zoning Ordinance is the tool used by county planners to implement the Trinity County General Plan goals and policies. Zoning provides an additional layer of land use planning guidance under the General Plan. While the General Plan offers broad policies, the Zoning Ordinance provides specific standards for development.

Project Consistency with the Trinity County General Plan

This section compares the goals and objectives of the Proposed Project to the relevant local planning policies (i.e., Trinity County General Plan, which includes the Lewiston, Douglas City, and Junction City community plans) to determine if there are any inconsistencies. The Trinity County General Plan contains all the state-required elements, including community development and design, transportation, natural resources, health and safety, noise, housing, recreation, economic development, public facilities and services, and air quality.

The goals and objectives described in Chapter 2 are generally compatible with the applicable General Plan goals and policies summarized above. The overall goal of the Proposed Project is to rehabilitate the sites described in Chapter 2 so that they function in a manner that reestablishes the alluvial nature of the Trinity River.

4.2.3 Environmental Impacts and Mitigation Measures

Methodology

The methodology used for the land use impact analysis involved an assessment of the compatibility of the Proposed Project and alternatives with relevant plans and policies; a review of the Trinity County General Plan, local community plans, and zoning in relation to surrounding land uses and site features; and communication with county staff. The analysis was conducted through a literature review and site visits.

Significance Criteria

The following significance criteria were developed based on guidance provided by the CEQA Guidelines. Impacts to land uses would be significant if they would

- result in land uses that are incompatible with existing and planned land uses adjacent to actions described as part of the project;
- conflict with any applicable land use plan, policy, ordinance, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect;
- disrupt or divide the physical arrangement of an established community;
- result in substantial nuisance effects on sensitive land uses that would disrupt use over an extended time period;
- convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use; or
- 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.

Impacts and Mitigation Measures

Table 4.2-5 summarizes potential land use impacts that could result from implementation of the project.

Table 4.2-5. Summary of Land Use Impacts for the No-Project Alternative, the Proposed Project, and Alternative 1

No-Project Alternative	Proposed Project	Alternative 1	Proposed Project with Mitigation	Alternative 1 with Mitigation
Impact 4.2-1. Implementation of the project could disrupt existing land uses adjacent to the project sites.				
No impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]

Table 4.2-5. Summary of Land Use Impacts for the No-Project Alternative, the Proposed Project, and Alternative 1

No-Project Alternative	Proposed Project	Alternative 1	Proposed Project with Mitigation	Alternative 1 with Mitigation
Impact 4.2-2. Implementation of the project could be inconsistent with the goals, policies, and objectives of the BLM RMP, the USFS LRMP, the DWR Hamilton Ranch Management Plan, the Trinity County General Plan, or other local community plans, policies, and ordinances.				
No impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]
Impact 4.2-3. Implementation of the project could affect the availability of a locally important mineral resource recovery site.				
No Impact	Significant	Significant	Less than significant	Less than significant

[1]Because this potential impact is less than significant, no mitigation is required.

Impact 4.2-1: Implementation of the project could disrupt existing land uses adjacent to the project site. ***No impact for the No-Project Alternative; less-than-significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, no activities would occur. There would be no temporary disruption to existing land uses within or adjacent to the project sites. Therefore, there would be no impact.

Proposed Project

The Proposed Project would not introduce a new land use within the boundaries of the Remaining Phase 1 or Phase 2 sites, and it would not obstruct the function of the 100-year floodplain. Project activities that aim to restore floodplain function would have long-term benefits for many land uses that are located along the Trinity River.

The Proposed Project is designed to minimize short-term disruptions to existing land uses adjacent to the project sites. The Remaining Phase 1 and Phase 2 sites are located on private, state, and federal lands that are adjacent to the Trinity River in the communities of Lewiston, Douglas City, and Junction City. Construction and staging areas would be located in and adjacent to the 100-year floodplain, which is designated as a Scenic Conservation overlay and is generally free of development. While many of the construction and staging areas would be located on state or federal lands along the 40-mile river reach, rehabilitation activities and river access would also occur on private lands that are adjacent to the river. Staging, construction, and access on private lands would require landowner approval. Residential and commercial development located on or near project sites is typically outside the areas of direct impact associated with the Proposed Project, and is generally located on uplands outside the 100-year floodplain.

There would be no road closures resulting from the project. Therefore, access to adjacent residences would be maintained during project construction and post-construction monitoring activities. However, access to adjacent residences could be temporarily disrupted during deployment of heavy equipment to and from the rehabilitation sites. Impacts associated with access to adjacent lands would be less than significant because they would be temporary.

Temporary disruption of public access to the river could occur at a number of sites, but would be localized. Moreover, the Remaining Phase 1 and Phase 2 projects would be implemented in phases over a 10-year period and would not preclude access from nearby access points located within several miles upstream and downstream of rehabilitation sites. For example, while Remaining Phase 1 project construction would occur at the UR site, river access would be available at the Old Lewiston Bridge and Bucktail river access points.

Construction activities in the river channel would not impair the adjacent land uses. No businesses or residences located adjacent to construction activities would be required to close or be emptied during project implementation. Construction and transportation associated with the Proposed Project could produce minor effects (i.e., air quality, aesthetics, and noise) at some nearby residences; however, such impacts would be temporary and would not significantly affect the ability to use adjacent lands. Project impacts associated with air quality, aesthetics, and noise are discussed in section 4.11, section 4.12, and section 4.14, respectively.

Land zoned as Timber Harvest, Ag Forest, and Agriculture is located in and adjacent to the project boundaries; however, there are no timber production or agricultural activities that extend into the project sites, nor are there any lands designated as Prime Farmland, Unique Farmland, or Farmlands of Statewide Importance.

Alternative 1

Like the Proposed Project, there would be no long-term land use impacts under Alternative 1. In general, long-term and temporary land use impacts related to Alternative 1 would be similar to those under the Proposed Project. However, the extent of such impacts would be less under Alternative 1 because of the smaller area of disturbance proposed. Alternative 1 would consist of less mechanical restoration, less staging area, less project-generated transportation, and a shorter duration for construction activities.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.2-2 **Implementation of the project could be inconsistent with the goals, policies, and objectives of the BLM RMP, the USFS LRMP, the DWR Hamilton Ranch**

Management Plan, the Trinity County General Plan, or other local community plans, policies, and ordinances. ***No impact for the No-Project Alternative; less-than-significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, the proposed rehabilitation activities would not occur, and there would be no inconsistency with the goals, policies, and objectives of the BLM RMP, the USFS LRMP, the Trinity River General Plan, or other local community plans, policies, or ordinances. Therefore, there would be no impact.

Proposed Project and Alternative 1

Implementation of rehabilitation activities proposed under either the Proposed Project or Alternative 1 would not introduce land uses that are incompatible with existing or proposed land uses nor would project activities conflict with federal, state, or local land use plans, policies, or ordinances.

Appendix A documents findings that support the determination that the activities proposed for the project would be consistent with the ACS.

The project goals and objectives described in Chapter 2 are generally compatible with the BLM RMP, the STNF LRMP, the Trinity County General Plan, and the Trinity County Zoning Ordinance. Project activities necessary for enhancing anadromous fisheries and river function would result in localized and short-term impacts to riparian vegetation in portions of the Remaining Phase 1 and Phase 2 sites. While in the short-term these activities would conflict with some goals and policies related to maintaining the riparian vegetation and the existing scenic quality of the river corridor, the purpose of removing riparian vegetation is consistent with the overall goals of the RMP, LRMP, Trinity County General Plan, and Trinity County Zoning Ordinance.

Open Space zones are intended to protect significant or critical wildlife habitat areas or areas that should not be developed due to public health and safety reasons. Because the purpose of this project is to rehabilitate the Trinity River and its fisheries, project activities carried out on lands zoned for Open Space would be consistent with this zone.

The purpose of the Trinity County Flood Hazard Districts and Flood Hazard overlay zones is to protect the public health, safety, and welfare; to protect fish and wildlife resources; and to minimize losses due to floods. According to the Zoning Ordinance, activities in the floodplain that could accomplish this purpose include "controlling the alteration of natural floodplains, stream channels, and natural protective barriers, which help to accommodate flood waters and maintain fish and wildlife resources." Because the project would enhance fish and wildlife resources and enhance the function of the floodplains, as well as act to protect the public health, safety, and welfare, this project would be consistent with the Flood Hazard District and Flood Hazard overlay zones.

Table 4.2-6 below provides specific consistency findings associated with rehabilitation activities that would occur in the Trinity River floodplain.

Table 4.2-6. Consistency of the Proposed Action and Alternative 1 with Applicable Flood Hazard Overlay Zoning District Standards

Objectives	Assessment of Consistency	
	Proposed Action	**Alternative 1**
Construction Materials and Methods		
All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.	Implementation of the Proposed Project would require temporary low water crossings to be constructed. The crossings would be necessary for access to several channel rehabilitation areas that are located in steep canyon terrain and lack overland access. The crossings have been designed by engineers to allow for unobstructed water flows. The project does not involve the placement of any permanent new construction or improvement to any existing structures within the floodplain (see Section 4.4, Water Resources). To improve river functions, natural substrates (i.e., cobbles, gravels, and sands) would be redistributed within several Phase 2 and Remaining Phase 1 sites.	Same as Proposed Action
Fill and Other Floodplain Encroachments		
All fill and other encroachments shall be certified by a registered professional engineer or architect not to increase the Base Flood Elevation more than 12 inches. Such a certification shall be provided to the Floodplain Administrator.	Implementation of the Proposed Action involves removal of alluvial (dredge) materials from the floodplain and redistribution of alluvial materials (fill) in a manner that would not result in a rise in the base flood elevation. Rehabilitation activities associated with removal and placement of alluvial materials in the floodplain have been designed by engineers with the purpose of improving floodplain function.	Same as Proposed Action

Overall, both the Proposed Project and Alternative 1 would further the goals and objectives of the federal and local land use goals associated with open space, conservation, safety, and land use. The project would not introduce a new land use in the project area, and it would not hinder future land use development at or adjacent to the Remaining Phase 1 and Phase 2 sites. This impact would be less than significant.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.2-3: Implementation of the project could affect the availability of a locally important mineral resource recovery site. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, no rehabilitation activities would be implemented. Therefore, there would be no impact on locally important mineral resource recovery sites.

Proposed Project and Alternative 1

Currently, there are two active aggregate mining operations near Phase 2 sites. The Smith aggregate operation is located a half mile downstream from the Lower Junction City site on Hocker Flat. This operation does not entail activities in the active river channel and is buffered from the active channel by a large berm. Implementation of either the Proposed Project or Alternative 1 would not affect mineral resource extraction at Hocker Flat. The Eagle Rock mine is another aggregate mining operation located upstream of Junction City. This operation is adjacent to Poison Gulch, which is a tributary of Oregon Gulch. Oregon Gulch flows into the Trinity River approximately 1 mile upstream from a Phase 2 site. This aggregate mining operation does not include operations in or adjacent to the Trinity River. Implementation of the Proposed Project or Alternative 1 would not affect mineral resource extraction in Poison Gulch.

There are no locally important mineral recovery sites identified by the state located within the boundaries of any of the rehabilitation sites. However, Trinity County was historically a gold mining region, and several unpatented mining claims exist throughout the Remaining Phase 1 and Phase 2 sites. Project construction activities associated with the Proposed Project and Alternative 1 that occur in the river could temporarily preclude individuals from accessing and actively working their mining claims. This could threaten their ability to maintain individual claims. This impact would be significant.

Additionally, private land owners adjacent to the river could have mineral rights within the Remaining Phase 1 and Phase 2 project sites. Project construction activities associated with the Proposed Project and Alternative 1 that occur in the river could temporarily preclude individuals from accessing minerals to which they have a right. This impact would be significant.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

4.2-3a Reclamation will provide notice of the project to landowners within the Remaining Phase 1 and Phase 2 sites and to individuals with mining claims within the project sites. Notice will be given prior to project implementation and will include a schedule of river access closures.

Significance after Mitigation

Less than significant

SECTION 4.3

Geology, Fluvial Geomorphology, Minerals, and Soils

4.3 Geology, Fluvial Geomorphology, Minerals, and Soils

This section describes the geology, fluvial geomorphology, soils, and mineral resources of the Trinity River basin in close proximity to the proposed mechanical channel rehabilitation sites. It also evaluates potential impacts to these resources from implementation of the Proposed Project and its alternatives.

4.3.1 Environmental Setting

Regional Geology

The 40-mile reach of the mainstem Trinity River between Lewiston Dam and the North Fork Trinity River occupies portions of two parallel but distinct geologic provinces: the Coast Ranges Province and the Klamath Mountains Province. This section focuses on the narrow corridor on either side of the Trinity River underlain by rocks of the Klamath Mountains Province.

The Klamath Mountains Province is divided into four north-south trending terranes. From east to west, these terranes are the Eastern Klamath, Central Metamorphic, Western Paleozoic and Triassic, and Western Jurassic. The terranes increase in age from west to east, except for the Central Metamorphic Terrane, which is slightly older than the Eastern Klamath Terrane. The rock units generally dip to the east, with the older eastern units overlying the younger western units. To varying degrees, these rock units are exposed throughout the 40-mile reach of the mainstem Trinity River.

The river corridor immediately downstream from Lewiston Dam and the Deadwood Creek watershed are underlain by rocks of the Eastern Klamath Terrane, primarily the Copley Greenstone, a metamorphosed volcanic sequence that consists mostly of intermediate and mafic volcanic rocks, and the Bragdon formation, a metamorphosed sedimentary formation that locally has been converted to gneiss and amphibolite. These units are considered to be generally stable and erosion-resistant (Strand 1977).

A belt of granitic rock, part of the Shasta Bally Batholith, trends roughly north to south near Lewiston. Outcrops of these granitic rocks are deeply weathered, highly erodible, and produce large volumes of sandy sediment (decomposed granite, or DG) when disturbed. Significant portions of both the Hoadley Gulch and Rush Creek drainages are underlain by these granitics, as well as rocks of the Eastern Klamath Terrane. Rush Creek also contains areas underlain by the Weaverville Formation, an unstable series of weakly consolidated mudstone, sandstone, and conglomerate with an impervious dark green clay matrix and sparse beds of light-colored tuffs.

Grass Valley Creek watershed is almost entirely underlain by deeply weathered Shasta Bally granitics. Historically high rates of sediment production in the Grass Valley Creek watershed led to the construction of the Buckhorn Debris Dam in the upper part of the watershed and on-going annual dredging of Hamilton ponds at the creek’s confluence with the Trinity River. Based on need, these ponds may be dredged on an annual basis

The next three major tributaries downstream from Grass Valley Creek (i.e., Indian Creek, Weaver Creek, and Reading Creek) primarily drain areas underlain by the Central Metamorphic sub-province, which includes two metamorphic rock units known as the Salmon Hornblende Schist and the Abrams Mica Schist. Both of these units are considered moderately erodible (Strand 1977). The Weaverville Formation outcrops in parts of the Weaver Creek drainage and in places along the Trinity River between Lewiston and Douglas City.

Downstream from Douglas City, the Trinity River flows into areas underlain by the Northfork and the Hayfork terranes. The Northfork Terrane consists of serpentinite, gabbro, and diabase along the western side. Rocks further east include silicious tuff, chert, mafic volcanic rock, minor lenses of limestone, phyllite, and, locally, sandstone and pebble conglomerate (Strand 1977). Serpentine intrusions within the unit produce unstable slopes. The Hayfork Terrane consists of metamorphic and meta-volcanic rocks that form the steep, stable slopes. Browns Creek and the south-side tributaries to the Trinity River near Junction City contain significant areas of both terranes. Canyon Creek, however, contains mostly rocks of the Central Metamorphic sub-province, with a substantial headwater area underlain by Shasta Bally granitics.

Sedimentary Deposits

The Weaverville Formation is a series of non-marine deposits. It consists of weakly consolidated mudstone, sandstone, and conglomerate with an impervious dark green clay matrix and sparse beds of light-colored tuffs. Gold-bearing alluvium in the Weaverville Formation was the target of the large hydraulic placer mining operations similar to the one that was developed on Oregon Mountain west of Weaverville. The Weaverville Formation tends to be unstable, particularly along roads and along streams where slopes are oversteepened.

Recent (Quaternary-aged) surficial deposits consist of recent and modern alluvium and historic hydraulic and dredge tailings from placer mining activities. These depositional features were the focus of large-scale placer gold mines that reshaped the alluvial landscapes of Trinity County, starting about 1850 with the discovery of gold at the mouth of Reading Creek. The introduction of hydraulic mining and, later, dredging equipment led to expanded gold-mining activities in the Trinity River basin. Large-scale dredging continued until the 1940s, resulting in extensive dredge tailing deposits along the Trinity River.

Glacial, Terrace, and Surficial Deposits

Glacially eroded materials, largely of granitic origin, add to the sediment input to the Trinity River system, particularly from streams such as Rush Creek and Weaver Creek that originate from the Salmon-Trinity Alps. Terraces composed of sand and gravel from glacial erosion flank much of the Trinity River upstream from the North Fork.

Regional Fluvial Geomorphology

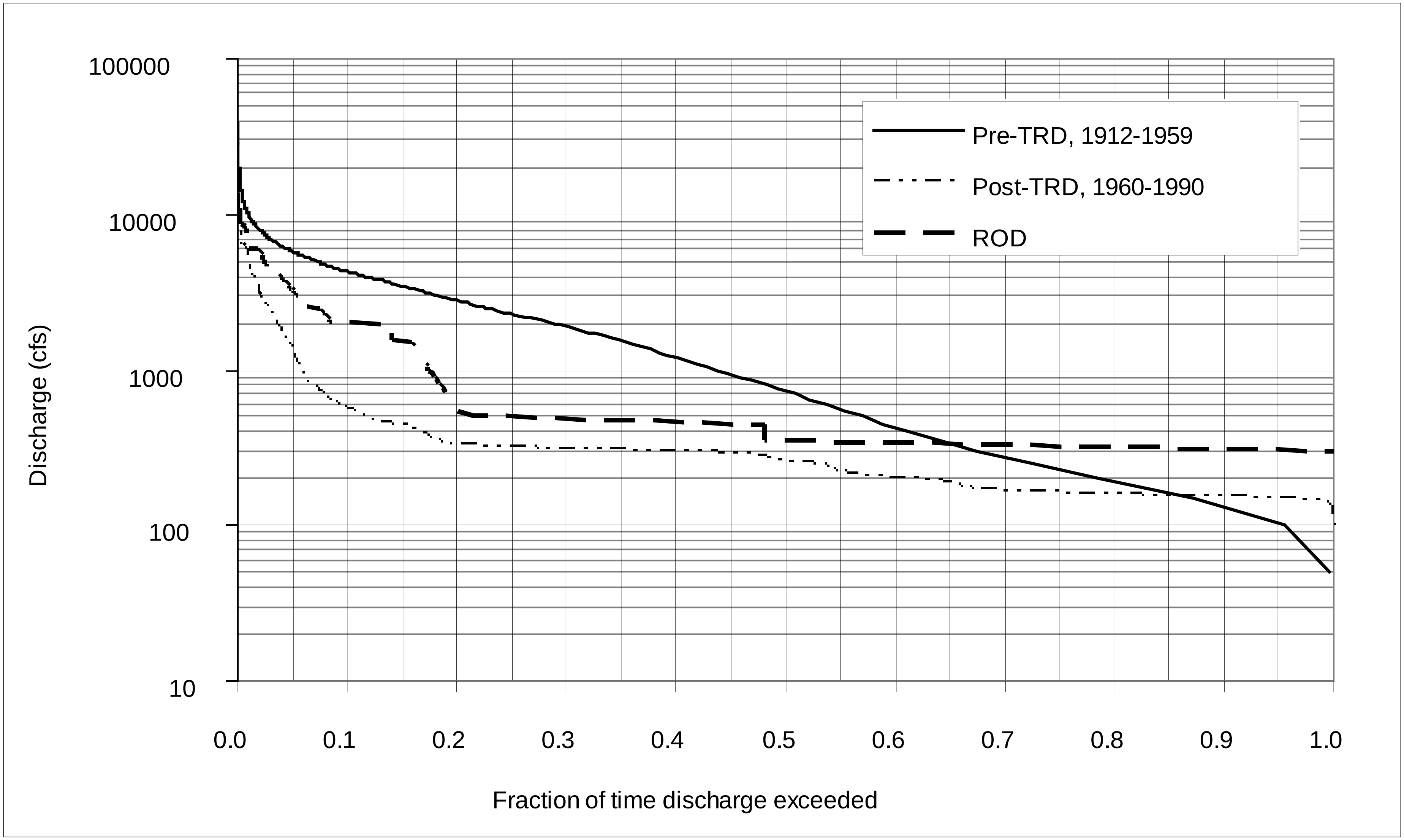
Fluvial geomorphology was fundamental in the evaluation and selection of the preferred alternative in the Trinity River Mainstem Fishery Restoration EIS. Addressing the relationships between flow, sediment, and vegetation formed the basis for the Implementation Plan for the TRRP (Appendix C of the Trinity River Mainstem Fishery Restoration FEIS (U.S. Fish and Wildlife Service et al. 2000)). This plan identified a number of actions and conditions concerning flow and sediment that would be implemented. These included the following:

- instream water release volumes and schedules to the Trinity River from Lewiston dam;
- mechanical channel rehabilitation (including riverine, high flow, and in-channel projects);
- sediment management (i.e., coarse sediment augmentation and fine sediment control);
- infrastructure modifications, such as bridge and structure relocation to pass ROD flows (e.g., new bridge construction and moving of wells, decks, and pumphouses);
- watershed protection program; and
- adaptive environmental assessment and management.

The natural hydrology of the Trinity River is characterized by intense winter storms capable of producing large floods, a spring snowmelt flood, and low summer baseflows. Peak flows and total annual discharges in the Trinity River downstream at Lewiston were drastically reduced with the construction of Trinity and Lewiston dams and diversion of Trinity water to the Central Valley (Figure 4.3-1). The pre-dam 2-year recurrence peak flow, based on the annual maximum flows for water years 1912 through 1959 at Lewiston (USGS Gage # 11525500, Trinity River at Lewiston, CA), was about 15,600 cfs. From 1960 through 1990, an average of 77 percent of the total annual water yield above Trinity Dam was diverted to the Sacramento River basin, and the 2-year recurrence peak flow discharged from Lewiston Dam was reduced to about 1,380 cfs. Lewiston and Trinity dams also trap all but the finest sediments delivered from the upper part of the Trinity River basin. At the same time, numerous minor tributaries continued to deliver copious quantities of sand and silt sized sediment to the Trinity River downstream from the dams.

Reductions in the supply of bed material sediments downstream from dams commonly result in an increase in the sizes of bed material sediments on the bed surface accompanied by reduced bed mobility (Williams and Wolman 1984). Concurrently, decreases in stream flows often result in the deposition of fine sediments on and within the gravel substrate, channel narrowing and the establishment of riparian vegetation in areas formerly occupied by active channel bed (Graf 1978; Friedman et al. 1996; Allred and Schmidt 1999; Gaeuman et al. 2005). All of these processes quickly occurred in the Trinity River in the first few decades following dam closure. Flow reductions and the loss of the coarse sediment supply allowed riparian vegetation to encroach into the pre-dam channel and large berms to deposit along the channel margin by about 1970 (Pelzman 1973), ultimately fossilizing formerly active gravel bars and clogging gravel substrates with sand and silt (U.S. Fish and Wildlife Service and Hoopa Valley Tribe 1999). These changes have substantially reduced the complexity and diversity of riparian and riverine habitats in the Trinity River.

The subsequent decline of the anadromous salmonid fishery in the river led to the implementation of flow releases from Lewiston Dam in the early 1990s. The rehabilitation activities intensified after the Secretary of Interior signed the 2000 ROD, establishing the TRRP. The 2-year recurrence peak flow at the Lewiston gage for water years 1992 through 2006 was about 5,120 cfs. Current dam operations include annual spring flow releases with peak flows ranging between 1,500–11,000 cfs, depending on the anticipated water yield captured by the TRD.



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North State Resources, Inc.

Figure 4.3-1
Pre- and Post-Dam Hydrology
USGS Stream Flow Gage at Lewiston

Ten attributes identified in the Trinity River Flow Evaluation Report (U.S. Fish and Wildlife Service and Hoopa Valley Tribe 1999) were used in the Trinity River Mainstem Fishery Restoration FEIS (U.S. Fish and Wildlife Service et al. 2000) to describe the geomorphic environment and processes of a healthy alluvial river. These “healthy river” attributes helped to provide a foundation for understanding the dynamic equilibrium of the river, and were used to develop recommendations to meet rehabilitation objectives.

The attributes presented in the Trinity River Flow Evaluation Report and the Trinity River Mainstem Fishery Restoration FEIS/EIR are as follows:

- attribute 1: spatially complex channel geomorphology;
- attribute 2: flows and water quality are predictably unpredictable;
- attribute 3: frequently mobilized channel bed surface;
- attribute 4: periodic channel bed scour and fill;
- attribute 5: balanced fine and coarse sediment budgets;
- attribute 6: periodic channel migration;
- attribute 7: a functional floodplain;
- attribute 8: infrequent channel resetting floods;
- attribute 9: self-sustaining diverse riparian plant community; and
- attribute 10: naturally fluctuating groundwater table.

An example of a reach in the TRRP project area that displays most of these attributes is shown in Figure 4.3-2. This reach demonstrates the three primary elements necessary to support the alluvial processes that maintain diverse, complex alluvial channel morphology, namely

- an adequate supply of bed material sediments to support high bed material transport rates and maintain bed surface mobility (attributes 3, 4, and 5);
- an alluvial corridor in which the channel can shift, i.e., the channel is not locked in position by valley walls, bedrock controls, structures, etc (attribute 6); and
- a variable flow regime capable of mobilizing bed and bank material sediments (attributes 2 and 8).

The supply of bed material sediments at the reach shown in Figure 4.3-2 is locally high because the reach is located a short distance downstream from Rush Creek, a tributary that contributes significant quantities of bed material sediments to the mainstem. Periodically, this locally important supply of gravel provides the building blocks for new gravel bars and replenishes gravel scoured from the reach during large flow events. Lateral migration of the channel removes older floodplain surfaces, provides room in the channel for new bars to form and grow, and allows the channel to respond to changes in alluvial features and riparian vegetation. Variable high flow releases from Lewiston Dam provide the energy to scour and transport sediment across a relatively wide range of channel locations. These processes create and maintain a variety of habitat elements that offer various ecological functions and values.

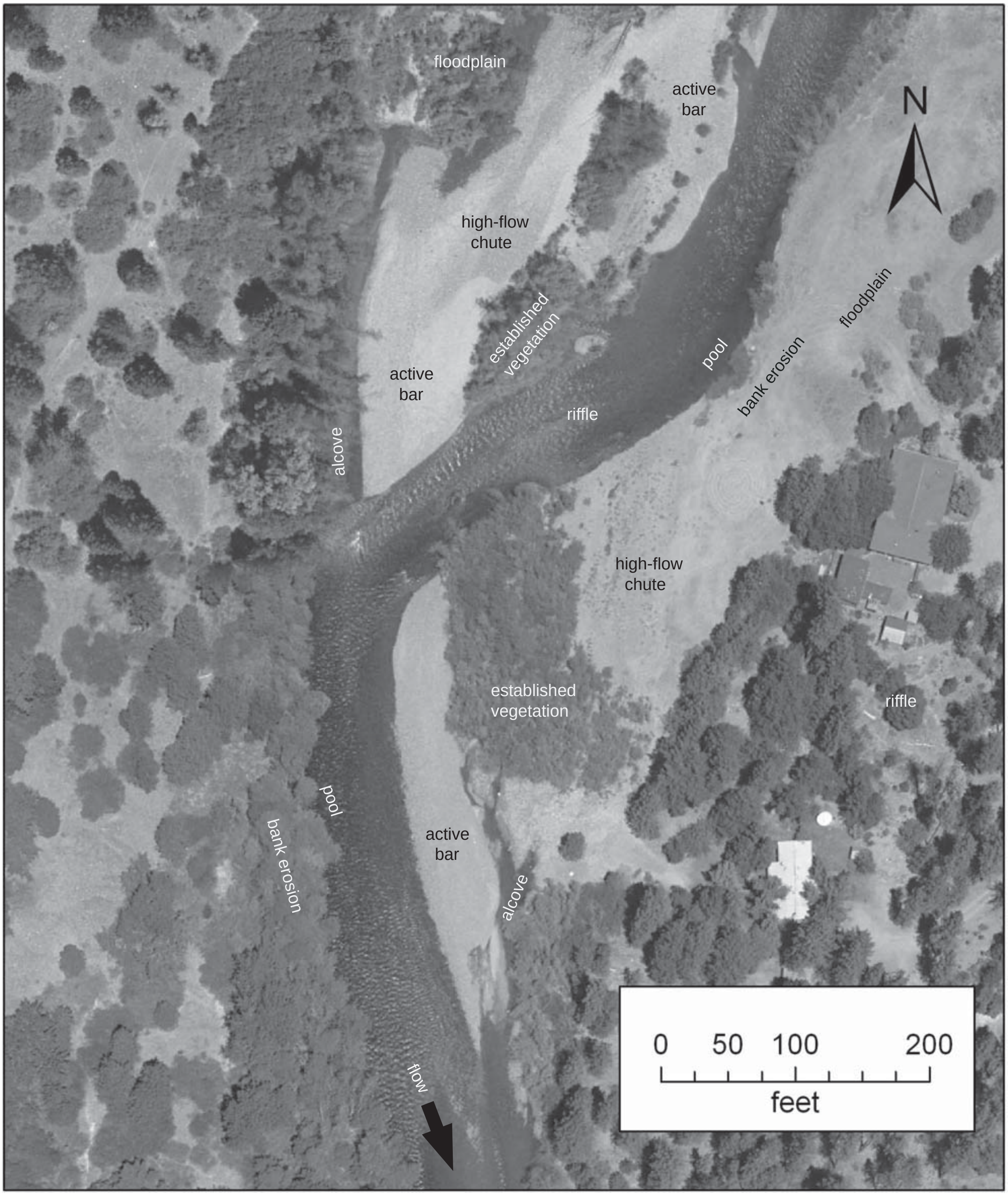

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Figure 4.3-2
Example of Alluvially Active Reach of Trinity River With Complex Channel Morphology

Geomorphic Consequences of the Trinity River Division of the Central Valley Project

The geomorphic environment of the 40-mile reach of the Trinity River below Lewiston Dam is directly affected by the construction and operation of the TRD. Post-TRD modification of the form and function of the alluvial features in this reach has altered, and to varying degrees, simplified the natural diversity of geomorphic processes and forms, habitats, and vegetation structures.

Few quantitative data are available to reconstruct the geomorphologic attributes of the pre-dam and pre-settlement Trinity River. The natural state of the river is essentially unknown because the area has been extensively modified by gold mining and other human disturbances since the mid-1800s. Mining activities in the second half of the 19th century used hydraulic cannons to placer mine entire mountain sides, inundating the main valleys with large quantities of sediment. While hydraulic mining was deemed illegal in Trinity County in the early 1900s, the advent of mechanized dredging had broad-scale impacts to alluvial deposits throughout the Trinity River basin well into the 20th century. Over time, most of the large alluvial features associated with the Trinity River and its major tributaries were subjected to dredge mining. This type of mining drastically altered the form and function of the Trinity River and its tributaries at many locations within the 40-mile reach. Timber management activities were initiated to support the mining industry, and following World War II, these activities accelerated resulting in the development of an extensive road network throughout the basin. Collectively, these activities contributed to the high sediment production rates documented in the Trinity River Total Maximum Daily Load (TMDL) for Sediment established by the EPA (North Coast Regional Water Quality Control Board 2001).

Post-mining but pre-dam conditions are primarily inferred from a few sets of aerial photographs and anecdotal accounts. Aerial photography of the TRRP project area taken in 1944 shows a denuded valley bottom containing extensive piles of dredger tailings, numerous dredger pits, and ongoing dredge operations. In some places, the channel itself is a trench-like feature set amid tailings piles, and likely represents the most recent pass of a dredge through the valley alluvium. In other locations, the channel has a braided appearance. The degree to which the pre-TRD channel planform was sculpted by fluvial processes as opposed to dredge operations is uncertain, but it is clear that some of the lower elevation tailings piles have been reworked by large winter floods, such as the December 1955 event when a peak discharge of 71,600 cfs was recorded at the Lewiston gage. The post-TRD channel includes numerous reaches bordered by high barren terraces with surface armor consisting of cobble-sized materials. Figure 4.3-3 illustrates these surfaces, which are most prevalent in the downstream third of the reach. These surfaces are interpreted as tailings that have been flattened by flood flows or, in some cases, subsequent post-dredging human activities.

The 1944 photographs clearly show that the pre-dam channel was larger than the modern channel, with minimal valley bottom riparian vegetation evident. With continued inputs of large quantities of fine sediments from tributaries downstream from Lewiston Dam, operation of the TRD allowed fine sediments to accumulate along the channel margins and riparian vegetation to colonize those new deposits. In some locations, the result was the development of a narrower, morphologically simple channel confined

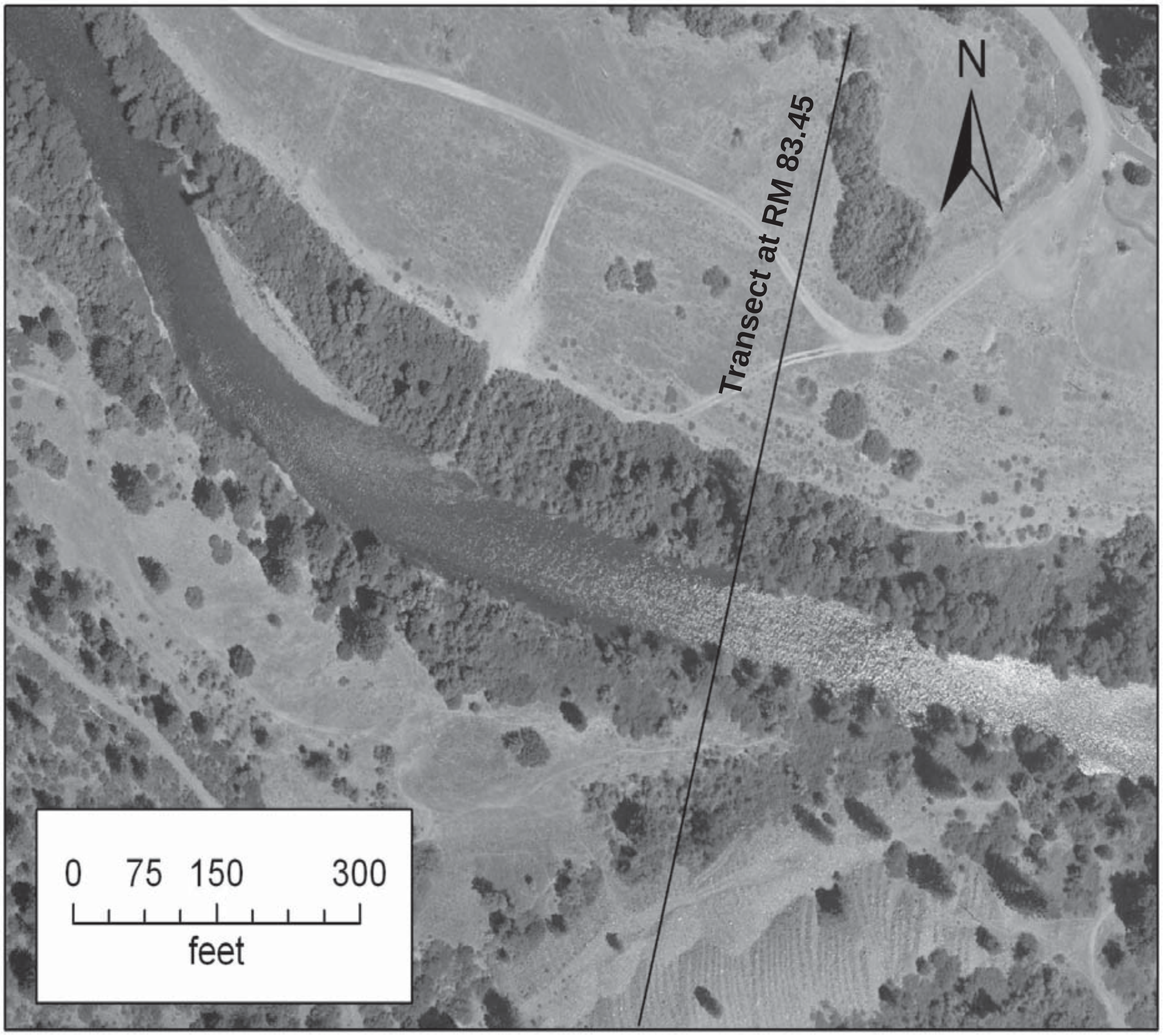


Figure 4.3-3
Simplified Channel with Riparian Berm
at River Mile 83.45

between tailings terraces. Figure 4.3-4 provides a graphical representation of the channel cross-section that corresponds to the transect location on Figure 4.3-3.

Figure 4.3-5 illustrates deposition of fine-sediments along the channel margin (edge) that have resulted in the formation of riparian berms (large densely-vegetated natural levees). These berms, referred to as *fossilized*, confine stream flows in a deep, narrow channel with little habitat value and disconnect flows in the main channel from adjacent valley bottoms that are otherwise low enough to function as a post-dam floodplain. Figure 4.3-6 provides a graphical representation of the channel cross-section that corresponds to the transect location on Figure 4.3-5. Fossilized berms have also been hypothesized to be essentially impervious to fluvial erosion, such that mechanical removal or destabilization is necessary before fluvial process can resume under the post-ROD flow regime.

The Trinity River Mainstem Fishery Restoration FEIS (U.S. Fish and Wildlife Service et al. 2000) describes the mechanical restoration alternative later adopted in the ROD primarily in terms of berm removal, with the ultimate objective being the restoration of a naturally migrating alluvial channel. Although riparian berms do exist within the 40-mile reach of the Trinity River below the TRD, subsequent analysis by representatives of the TMC since the ROD was issued in 2000 has revealed that berms are not as ubiquitous as was earlier assumed. According to a geomorphic map prepared in 2003 by consultants to the Hoopa Valley Tribe, berms exist along only about 20 percent of the total bank length within this reach. This percentage is based on the assumption that all features mapped as berms are indeed berms, that is, they are significantly higher than an adjacent surface that could otherwise function as a floodplain. Similarly, subsequent field observations indicate that the proportion of the river that is unconfined and subject to channel migration is considerably smaller than implied in the 2000 ROD and early TRRP technical investigations. According to field mapping and subsequent GIS analysis conducted by TRRP scientist in 2007, approximately 35 percent of the bank length outside of the "canyon" segment (roughly between Dutton Creek and Dutch Creek) is non-alluvial due to confinement or close proximity to bedrock, valley walls, road embankments, etc. The remaining unmapped canyon segment contains about 8 percent of the total bank length between Lewiston Dam and the North Fork Trinity River, and is generally regarded as being almost entirely non-alluvial. The proportion of bank length within the 40-mile project area that is essentially non-alluvial is conservatively estimated to be 43 percent. This estimate does not include sections of bank that are highly resistant to erosion due to the presence of very coarse bank materials associated with dredge tailings.

These results have significant implications for planning and designing mechanical rehabilitation projects, and for realistically anticipating the channel forms and processes that the rehabilitated river can support. First, alluvial function cannot be restored in many reaches by the removal or destabilization of a relatively narrow berm. Instead, large scale excavation of terraces will be required to establish a functioning floodplain and a dynamic sinuous channel. Second, in many other reaches valley or bedrock confinement precludes establishment of a migrating alluvial channel. Alluvial dynamics in such reaches will be limited mainly to the vertical dimension – vertical cut and fill and bed-level as illustrated in Figure 2.3 a-i. Such limitations need to be considered in the rehabilitation design process, when projecting future site evolution and when evaluating rehabilitation success.

Figure 4.3-4
HEC-RAS Cross Section of Channel at River Mile 83.45
Showing Confinement by High Terraces and Tailings Piles

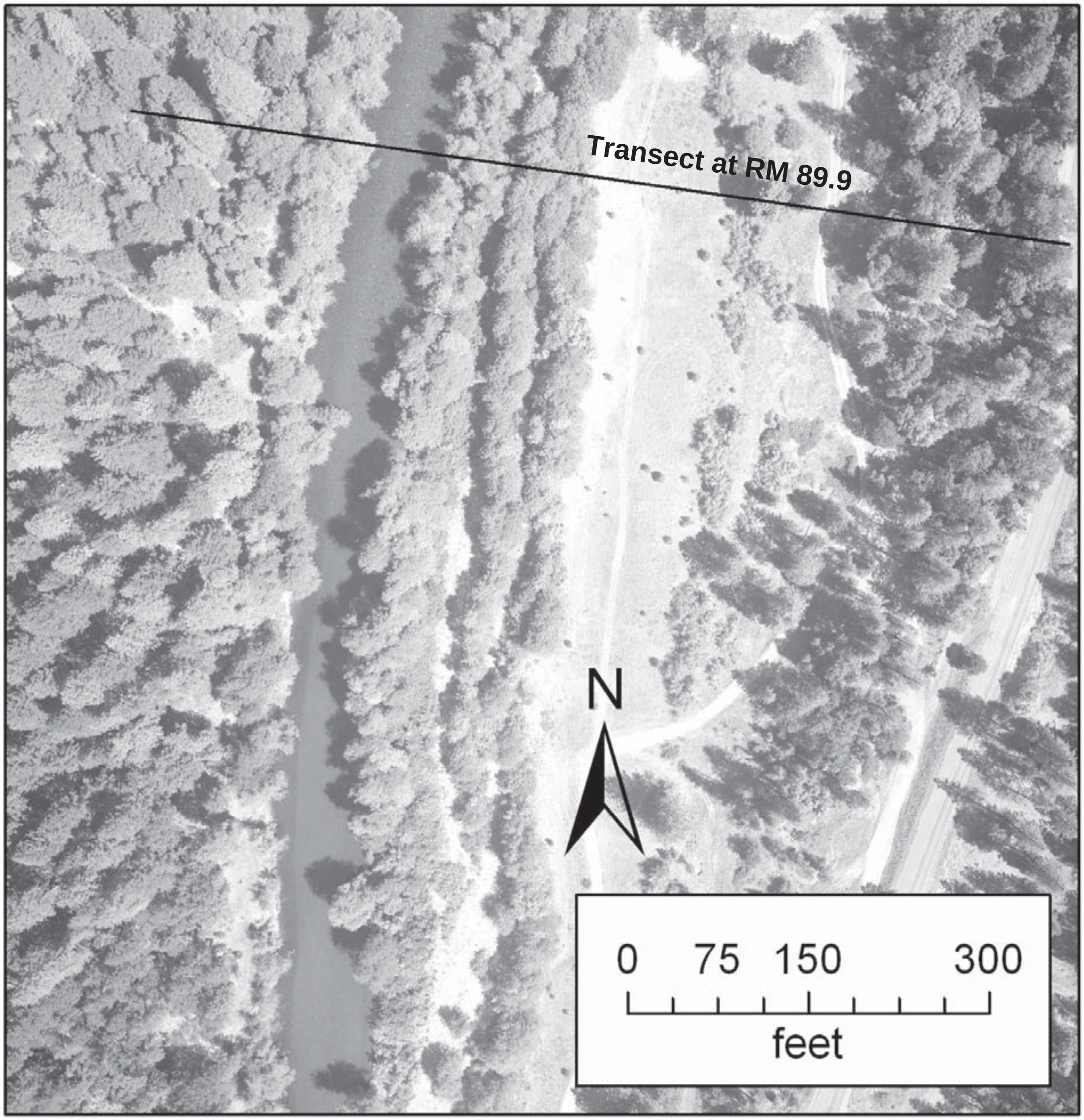


Figure 4.3-5
Simplified Channel with Riparian Berm at River Mile 89.9

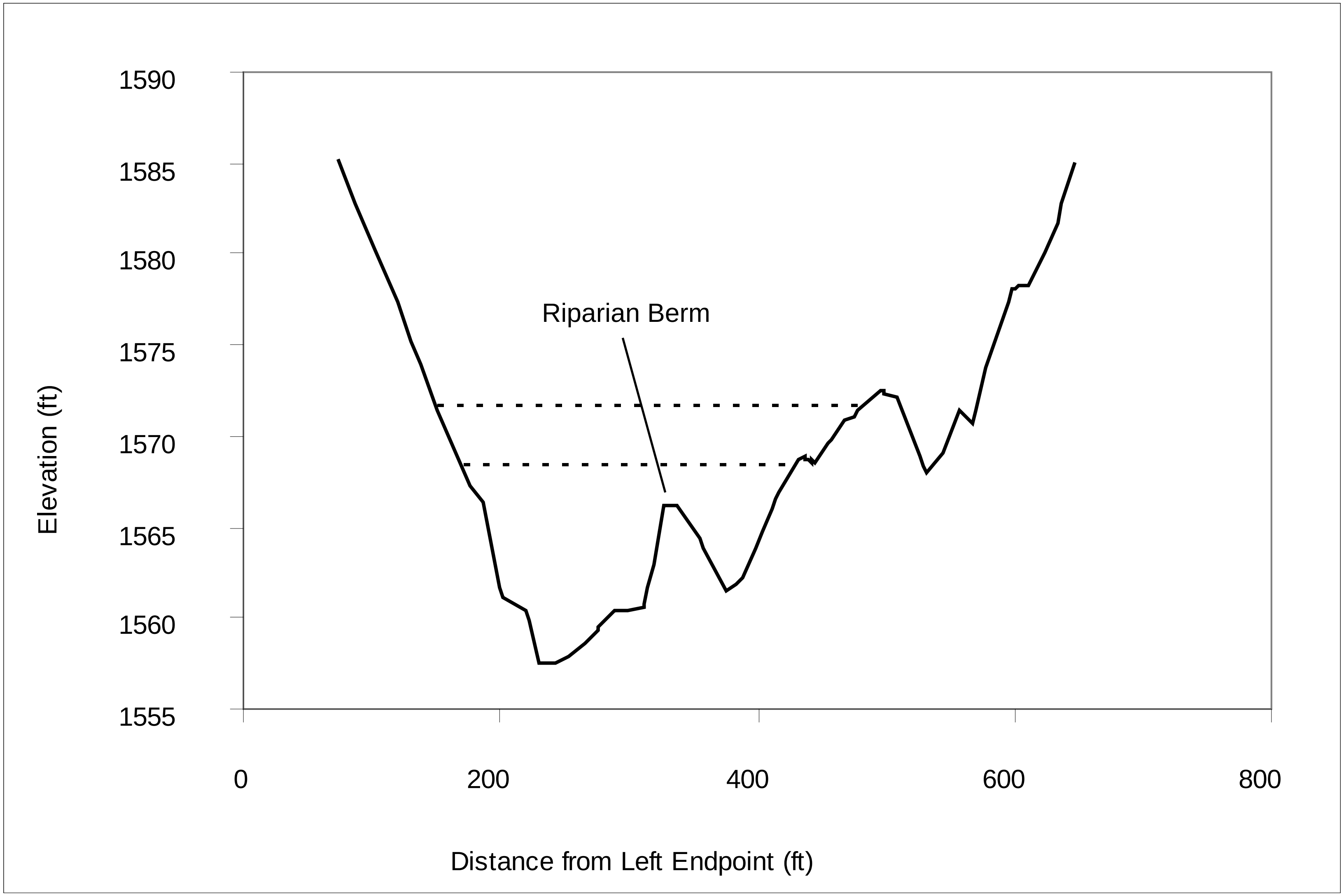


Figure 4.3-6
HEC-RAS Cross Section of Channel at River Mile 89.9
Showing Confinement by a Berm

Mines and Mineral Resources

The geologic properties of many of the units in the Klamath Mountains Province are related to their origins as oceanic crust and/or their intrusion by plutonic bodies. These properties have resulted in mineralization that is widely distributed. Many minerals of economic importance are present, including gold, copper, zinc, chromite, manganese, platinum, silver, and mercury. These minerals have been mined from the advent of European settlement to the present by a variety of methods.

Historically, the principal mineral of economic importance was gold. Both lode (hardrock) mines and placer (alluvial gravel) mines were present in the watershed with activity from 1848 to the present. The tailing deposits associated with large-scale placer mining provide a substantial source of aggregate required in various construction projects.

Until the 1940s, recent and ancient alluvial deposits were extensively mined using a variety of techniques. The hydraulic mining operations used high water pressure to erode and mobilize large quantities of unconsolidated overburden from gold-bearing areas. Evidence of this activity can be seen at various locations along the reach, including the Union Hill Pond. Large-scale bucket-line dredge operations were also common between 1930 and 1950. These activities left behind tailing deposits that continue to influence the form and function of the Trinity River and are apparent at a number of the rehabilitation sites described in Chapter 2.

Since World War II, mineral extraction activities have focused on aggregate resources, although some gold mining activity continues, primarily using suction dredging. Over time, aggregate mining of alluvial deposits and reworking of hydraulic tailings have resulted in additional channel modifications and changes in sediment supply.

Active Mining Claims

The General Mining Law of 1872 is one of the major statutes that direct the federal government’s land management policy. The law grants free access to individuals and corporations to prospect for minerals in public domain lands and allows them, upon making a discovery, to stake (or “locate”) a claim on that deposit. Sections of the Trinity River that are under federal jurisdiction are therefore open to prospecting.

There are 36 named active mining claims (U.S. Bureau of Land Management 2008) associated with the Trinity River in the 40-mile reach below Lewiston Dam. Figure 4.3-7 illustrates the general location (by legal subdivision) of these active claims relative to the Remaining Phase 1 and Phase 2 sites. With the exception of claims in the general vicinity of the SB site, the majority of the claims are in the general vicinity of one or more Remaining Phase 2 sites. Information available in BLM’s database is not specific enough to make a determination of claim location relative to rehabilitation sites.

BLM records identify most of these claims as placer claims. Placer claims are established with the intent to sort unconsolidated alluvial materials for precious metals (e.g., gold, platinum). Currently, there are no authorized operating plans for placer mining activities within or in close proximity to any TRRP rehabilitation sites, although suction dredging does occur at various locations along the Trinity River.

Suction dredging is the principal mining method currently used on the Trinity River for precious metals. In addition to activities on mining claims, this type of placer mining also occurs seasonally on private property throughout the Trinity River basin, primarily during base-flow periods. Other than mining activities authorized under the Surface Mining and Reclamation Act (SMARA), information on private mining activities in Trinity County is limited.

According to records provided by BLM and Trinity County, there are currently no approved mining activities operating under the provisions of the 1872 mining law or a county SMARA permit within, or in close proximity to, any of the Remaining Phase 1 or Phase 2 sites. There are, however, two active mining operations in the region that operate under a County SMARA permit, the Eagle Rock Mine and the Smith Mine. The Eagle Rock mine, a sand and gravel extraction company, is currently operating at the site of the historic La Grange Hydraulic Gold Mine upstream of Junction City. The Smith Mine is active on an intermittent basis based on market conditions.

Geologic Hazards

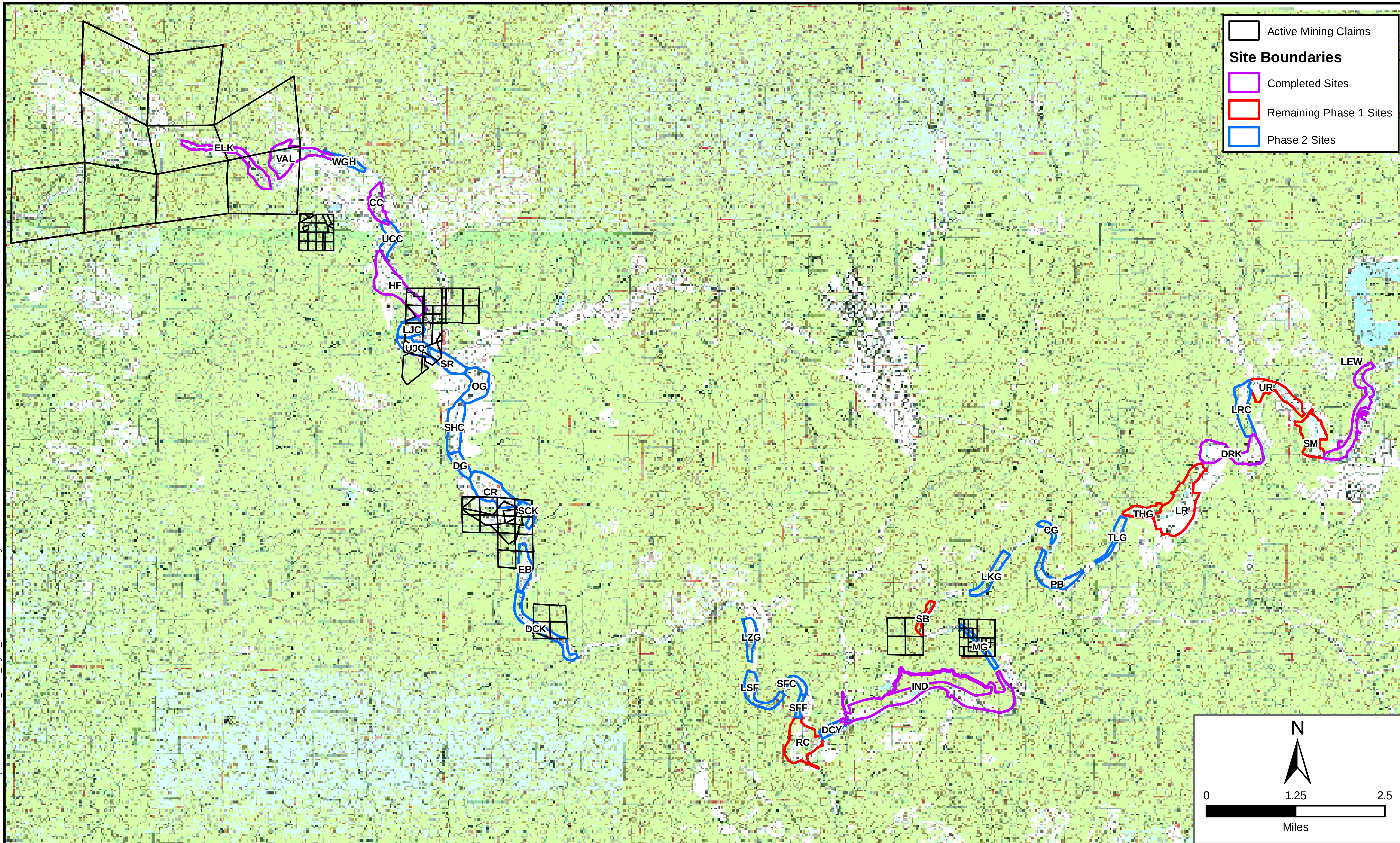
Seismicity and Seismic Hazards

Seismicity refers to the geographic and historical distribution of earthquakes, while a seismic hazard refers to the risk of loss from damaging effects caused by earthquakes. Historic earthquake activity in the study area has been very low. No areas of Trinity County are described or mapped as Fault-Rupture Hazard Zones under the Alquist-Priolo Earthquake Fault Zoning Act (California Department of Conservation Division of Mines and Geology 1999). The region, however, may be subject to low to moderate levels of ground shaking from nearby or distant earthquakes.

The most recent 1996 Probabilistic Seismic Hazards Assessment Model for California (California Division of Mines and Geology 1999) characterizes the study reach as having a 10–20 percent probability of a seismic event occurring that would cause peak ground acceleration (Pga) to be exceeded, assuming that a seismic event of that magnitude has a 10 percent probability of occurring every 50 years (California Geological Survey 2007). The study area is located between 62 and 124 miles from the northern San Andreas fault zone and the Cascadia Subduction Zone, which are the closest known active areas capable of producing an earthquake with a magnitude of 8.5 or greater.

Maximum credible earthquakes (MCEs) were determined for potentially significant faults, including Likely, Hat Creek, Freshwater, Mendocino, and San Andreas. These MCEs have projected surface wave magnitudes that range from 7 to 8.5. A maximum Modified Mercalli Level of VI to VII was also estimated for local seismicity (Trinity County 2003). The Modified Mercalli scale describes the intensity of an earthquake's effects at a given locality. The Mercalli level described above generally equates to a widely felt, often frightening, but minimally to moderately damaging earthquake.

No local active Quaternary faults have been identified, although little detailed mapping of Quaternary geologic features has been conducted in the area. However, there are historic faults that may influence the hydrology of the Trinity River if they were reactivated. There are several small faults near the LR and



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North State Resources, Inc.

Trinity River Restoration Program: Phase 1 and Phase 2 Sites

Figure 4.3-7
Active Mining Claims in General Vicinity of TRRP Sites

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DCY sites, and there is a large fault lineament that trends southeast to northwest and extends from the headwaters of Reading Creek through the headwaters of the North Fork Trinity River (Strand 1977).

Liquefaction

Liquefaction is a process whereby water-saturated granular soils are transformed to a liquid state during ground shaking. Loose to medium dense sands, gravels, and silts occurring below the water table are prone to liquefaction. The soils bordering this reach of the Trinity River in immediate proximity to the rehabilitation sites are predominantly alluvial. These soils have the potential to undergo liquefaction; however, no detailed analysis of the potential for liquefaction was conducted because the activities associated with the Proposed Project and its alternatives would not affect the potential for liquefaction or be affected by liquefaction were it to occur.

Landslides

The potential for landslides triggered by seismic events is not considered significant along the 40-mile reach of the mainstem Trinity River due to the low historical seismicity and the distance from active faults capable of producing high-magnitude earthquakes. There is a potential for steep-sided confined sections of this reach with unstable geologic materials to experience slope failures during seismic events. Possible effects of large landslides could include temporary damming of the mainstem Trinity River, or at least a temporary alteration of the hydrology due to a localized change in gradient and resulting increases in sediment load. It is unlikely that the effects of such an event would persist for a sufficient period to affect the rehabilitation sites described in Chapter 2.

The potential for landslides exists throughout the 40-mile reach of the mainstem Trinity River. Typically, landslides in the Klamath Mountains Province occur in association with high precipitation and runoff events. To varying degrees, the inherent slope stability along the reach is dependent on the underlying geology. The underlying geology of the reach is dominated by metamorphosed marine-sedimentary rock, which generally has layers of incompetent rock embedded within its stratigraphy. These incompetent layers can facilitate landslides, depending on their spatial relationship with the river and other local geographic features. Additionally, disturbance associated with historic mining features, road construction, and high-intensity wildfires could further influence landslide types and locations along the reach. Although landslides are a common occurrence along SR 299 and other roadways in Trinity County, these features are typically intercepted by the highway and contribute little, if any, material to the river along the reach.

Seiches

A seiche is an oscillation or standing wave in a body of water confined in a basin. Seiches commonly arise from a sudden local change in atmospheric pressure accompanied by wind and, occasionally, tidal currents. They can also occur as the result of ground shaking caused by earthquakes or by the force of large landslides or debris flows entering a water body. Local water bodies capable of generating a large-scale seiche include Trinity Lake, Lewiston Lake, and Grass Valley Creek Reservoir. The hazards associated with a seiche involve the overtopping or possible failure of these dams, with resulting modifications to the flow regime of the Trinity River (i.e., flooding). However, the likelihood of such an event is considered small.

Volcanic Activity

Volcanic hazards in the general vicinity of the rehabilitation sites are limited primarily to ash fall and minor seiches in Trinity and Lewiston lakes. There are three large active volcanoes in the Cascade Range in California—Lassen Peak, Mount Shasta, and the Medicine Lake Volcano—as well as numerous smaller vents. The distance (75 to 100 miles) from these volcanic centers and the prevailing westerly winds suggests it is unlikely that the Proposed Project or its alternatives would be significantly affected by a volcanic eruption (Trinity County Historical Society 2001; Trinity County 2003)

Soils

Most of the soils on the project sites are described in the Soil Survey of Trinity County, California, Weaverville Area (U.S. Department of Agriculture 1998), with lesser amounts described in the Soil Survey of Shasta-Trinity National Forest Area, Parts of Humboldt, Siskiyou, Shasta, Tehama, and Trinity Counties, California (Natural Resources Conservation Service 2008). A 500-foot zone of influence perpendicular to the 40-mile reach of the mainstem Trinity River was used to characterize the soil units that occur within this reach. More than 60 different soil types occur within or in close proximity to the rehabilitation sites described in Chapter 2. Appendix F provides a table of these soil types.

Soils derived from granitic or ultramafic rocks are typically fine-grained and often referred to as decomposed granite. While these soils occur in isolated locations, they are recognized as a leading contributor of fine sediments (sand) to the Trinity River. Grass Valley Creek, originating in the headwaters of the Shasta Bally Batholith, has been the subject of ongoing sediment reduction efforts by Reclamation, BLM, and private land managers for more than 20 years.

4.3.2 Environmental Impacts and Mitigation Measures

Methodology

Data for the following analysis were taken from existing reports on regional and local geology as well as on-site assessments during field reviews. These reports include the following documents: Geology of Northern California (U.S. Geological Survey 1966); Soil Survey of Trinity County, California, Weaverville Area (U.S. Department of Agriculture 1998); site-specific reports documenting wetland delineations performed by North State Resources for the TRRP; Trinity River Mainstem Fisheries Restoration Program EIS; Trinity River Maintenance Flow Study Final Report (McBain and Trush 1997); Trinity County General Plan; and previously cited online and Geographic Information Systems (GIS) data sources.

Criteria for Determining Significance

A project would have a significant impact related to geology, geomorphology, soils, and minerals if it could subject people, structures, or other resources to geologic or seismic hazards or disrupt, eliminate, or otherwise render geologic, soil, or mineral resources unusable or unavailable. Significant impacts would occur if the project would

- expose people, structures, or critical utility facilities to major geologic hazards (including seismicity, landslides, seiches, and liquefaction);
- involve changes in topography that would result in unstable soil conditions;
- increase erosion rates to a level at which associated sedimentation levels could affect streams, rivers, or other water bodies;
- interfere with existing, proposed, or potential development of mineral resources; or
- be inconsistent with the ten Trinity River healthy alluvial river attributes.

Impacts and Mitigation Measures

Table 4.3-1 summarizes the potential geology, fluvial geomorphology, soils, and mineral resource impacts that would result from the No-Project Alternative, the Proposed Project, and Alternative 1.

Table 4.3-1. Summary of Geology, Fluvial Geomorphology, Soils, and Minerals Impacts for the No-Project Alternative, Proposed Project, and Alternative 1

No-Project Alternative	Proposed Project	Alternative 1	Proposed Project with Mitigation	Alternative 1 with Mitigation
Impact 4.3-1. Implementation of the project could result in the exposure of structures and people to geologic hazards, including ground shaking and liquefaction.				
No impact	No impact	No impact	Not applicable[1]	Not applicable[1]
Impact 4.3-2. Construction activities associated with the project could result in increased erosion and short-term sedimentation of the Trinity River.				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.3-3. Implementation of the project would interfere with existing, proposed, or potential development of mineral resources.				
No impact	Significant	Significant	Less than significant	Less than significant

[1] Because this potential impact is less than significant, no mitigation is required

Impact 4.3-1: Implementation of the project could result in the exposure of structures and people to geologic hazards, including ground shaking and liquefaction. ***No impact for No-Project Alternative, Proposed Project, and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, no construction activities would occur. There would be no new exposure of structures and people to geologic hazards. Therefore, there would be no impact.

Proposed Project and Alternative 1

Under the Proposed Project and Alternative 1, no permanent structures or facilities would be constructed. There would be no new exposure of structures and/or people to geologic hazards.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative I

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.3-2: Construction activities associated with the project could result in increased erosion and short-term sedimentation of the Trinity River. ***No impact for No-Project Alternative; significant impact for Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, the project would not be constructed, and no construction-related erosion or associated short-term sedimentation of the Trinity River would occur. The managed flows of the Trinity River would continue to modify the bed and banks of the Trinity River to varying degrees on a reoccurring basis. Channel modifications may result in changes to the overall sediment flux in a manner that influences erosional processes related to the Trinity River. Since the proposed project would not be constructed, there would be no impact.

Proposed Project

Most of the rehabilitation activities described in Chapter 2 would occur in or near flowing water and could expose introduced, newly disturbed, and stable sediments and other alluvial materials to flowing water. Sediment exposed to flowing water has an increased potential to mobilize and be transported downstream, resulting in impacts such as short-term increases in surficial and channel erosional processes; increases in turbidity levels; and changes to the type, volume, and character of deposition downstream. Monitoring results at previous TRRP channel rehabilitation sites (i.e., Hocker Flat, Canyon Creek, Indian Creek, and Lewiston-Dark Gulch) demonstrate that these impacts decrease rapidly once construction activities have ceased and the existing hydrologic conditions have shaped the disturbed area into a quasi-stable configuration. However, downstream turbidity levels may become elevated again as seasonal fluctuations in hydrologic conditions (winter or spring high-water conditions) further shape the disrupted area into a more stable geometry.

Construction activities in the riverine and uplands areas would decrease soil cohesion and armoring, which would increase soil exposure to energetic weather conditions and increase the short-term potential for wind and water erosion. Increased wind and water erosion and subsequent downstream sediment transport within the Trinity River would occur if any soils were left exposed during the wet season (typically November through May) and other infrequent precipitation events, such as summer thunderstorms.

Implementation of the Proposed Project would result in temporary soil disturbance, soil compaction, and sediment mobilization associated with in-channel, riverine, and upland area restoration activities. Susceptibility to erosion is controlled by several factors, including terrain, land use, vegetation, soil type, and local climate. A soil with high erodibility typically erodes at a higher rate than a soil with low erodibility. However, in the absence of an adverse condition (e.g., rainfall or lack of vegetation), a soil that is classified as highly erodible may not experience significant erosion. During or after excavation and other related construction activities, the highest rate of soil erosion would most likely occur near the margins of constructed features (e.g., feathered edges, side channels, and floodplains). The activities would place spoil piles at upland locations that are not hydrologically connected to the Trinity River (surface water features). At these locations, the exposure of fine-textured soils during and after construction would increase the potential for soil erosion and sedimentation. This would be a significant impact.

Impacts to water quality are analyzed in section 4.5, Water Quality, and impacts to fisheries are analyzed in section 4.6, Fishery Resources.

Alternative 1

Under Alternative 1, the location, number, and magnitude of activities would decrease. This alternative would limit the types of activities to those that simply remove the riparian berms and reestablish functional side-channels at select locations. The elimination of some activities would translate to an overall reduction in the volume of excavation (cut/fill) at the rehabilitation sites; the number of roads and staging areas; the number of in-channel activities, including crossings; and the amount of soil disturbance that could contribute sediment to the Trinity River or its tributaries. Nonetheless, the impact would be significant.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative I

4.3-2a Reclamation will implement the following measures during construction activities:

- Areas where ground disturbance would occur will be identified in advance of construction and limited to only those areas that have been approved by Reclamation.
- All vehicular construction traffic will be confined to the designated access routes and staging areas.
- Disturbance will be limited to the minimum necessary to complete all rehabilitation activities.
- All supervisory construction personnel will be informed of environmental concerns, permit conditions, and final project specifications.

4.3-2b Reclamation will prepare an erosion and sedimentation control plan (Storm Water Pollution Prevention Plan [SWPPP]). Measures for erosion control will be prioritized based on proximity to the river. Reclamation will provide the SWPPP for review by associated agencies (e.g., BLM, the Regional Water Board, NMFS, and CDFG) upon request. Reclamation's project manager will ensure the preparation and implementation of an erosion and sediment control plan prior to the start of construction.

The following measures will be used as a guide to develop this plan:

- Restore disturbed areas to pre-construction contours to the fullest extent feasible.
- Salvage, store, and use the highest quality soil for revegetation.
- Discourage noxious weed competition and control noxious weeds.
- Clear or remove roots from steep slopes immediately prior to scheduled construction.
- Leave drainage gaps in topsoil and spoil piles to accommodate surface water runoff.
- To the fullest extent possible, cease excavation activities during significantly wet or windy weather.
- Use bales, wattles, and/or silt fencing as appropriate.
- Before seeding disturbed soils, work the topsoil to reduce compaction caused by construction vehicle traffic.

- Rip feathered edges (and floodplain surfaces where appropriate) to approximately 18 inches deep. The furrowing of the river's edge will remove plant roots to allow mobilization of the bed, but will also intercept sediment before it reaches the waterway.

- Spoil sites will be located such that they do not drain directly into a surface water feature, if possible. If a spoil site would drain into a surface water feature, catch basins will be constructed to intercept sediment before it reaches the feature. Spoil sites will be graded and vegetated to reduce the potential for erosion.

- Sediment control measures will be in place prior to the onset of the rainy season to ensure that surface water runoff does not occur. Project areas will be monitored and maintained in good working condition until disturbed areas have been revegetated. If work activities take place during the rainy season, erosion control structures shall be in place and operational at the end of each construction day.

Significance after Mitigation

Less than significant

Impact 4.3-3: **Implementation of the project would interfere with existing, proposed, or potential development of mineral resources.** ***No impact for the No-Project Alternative; less than significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, the project would not be constructed, and no interference with existing, proposed, or potential development of mineral resources would occur as a result of activities described in Chapter 2. Therefore, there would be no impact.

Proposed Project

As illustrated in Figure 4.3-7, there are a number of active mining claims located in the general vicinity of the Trinity River below Lewiston Dam. Other than specific information provided to the TRRP staff relative to the SB site, there is no evidence that any of the activities described in Chapter 2 would have any affect on mineral resources located on public or private lands within the boundaries of the rehabilitation sites. Excavation and other construction activities could inhibit the development of mineral resources on mining claims or private lands. In addition, local increases in turbidity could impair suction dredge operations downstream. There are two current aggregate mining activities operating through a County SMARA permit, the Eagle Rock and Smith aggregate mines. The Eagle Rock Mine is not located within hydrologic influence of the Trinity River and will not likely be affected by the Proposed Project. The Smith Mine is located within the boundary of the completed Hocker Flat site and continues to operate intermittently following completion of the Hocker Flat Project. Additionally, there are at least 36 named mining claims along the Trinity River on public lands managed by BLM. Currently, BLM has no authorized operating plans for mines along this reach of the Trinity River. Mining activities are likely to occur on private lands in this reach; however, it is unlikely that land owners would authorize activities associated with the Proposed Project that preclude their ability to develop mineral resources. Overall, the Proposed Project could inhibit the development and extraction of mineral resources, including precious metals and aggregate resources within and in close proximity to rehabilitation sites. This would be a significant impact.

Alternative 1

Under Alternative 1, the location, number, and magnitude of activities would decrease. The overall reduction in activities and the substantial decrease in the overall acres and volume of material would reduce the impacts related to the development and extraction of mineral resources. However, because of the potential conflicts between mineral management and rehabilitation activities, the impact would be significant.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Proposed Project and Alternative 1

Increased sedimentation rates in the Trinity River could degrade the quality and impair access to existing placer deposits. Reclamation or its contractors will implement the same erosion control measures proposed for Impact 4.3-2. Implementation of these procedures should reduce the amount of disturbance at each site and thereby reduce the amount of sediment entering the Trinity River. Decreased sediment input into the fluvial system will assist in limiting the impacts to existing placer deposits caused by construction activities.

4.3-3a Reclamation will implement the following measures during construction:

- Areas where ground disturbance would occur will be identified in advance of construction and limited to only those areas that have been approved by Reclamation.
- All vehicular construction traffic will be confined to the designated access routes and staging areas.
- Disturbance will be limited to the minimum necessary to complete all rehabilitation activities.
- All supervisory construction personnel will be informed of environmental concerns, permit conditions, and final project specifications.

4.3-3b Reclamation will prepare an erosion and sedimentation control plan (SWPPP) as stipulated in Mitigation Measure 4.3-2b.

4.3-3c Reclamation will coordinate with private land owners and owners of active mining claims to develop site-specific measures that can be implemented to avoid or lessen project-related impacts to mineral resources associated with the Trinity River and its tributaries.

Significance after Mitigation

Less than significant

SECTION 4.4

Water Resources

4.4 Water Resources

This section describes the water resources in the vicinity of the proposed mechanical channel restoration sites. It also evaluates potential impacts to water resources from implementation of the Proposed Project and its alternatives.

4.4.1 Environmental Setting

Surface Water Hydrology

Since 1960, the TRD has been the major determinant of the hydrologic conditions affecting the mainstem Trinity River, particularly in the 40-mile reach downstream of Lewiston Dam. Accretion flows from tributaries to the Trinity River modify the flow regime and contribute water, sediment, and other materials throughout the water year. Figure 1-2 shows the locations of the proposed rehabilitation sites along the Trinity River and its tributaries.

The Trinity River is the largest tributary to the Klamath River. From its headwaters to its confluence with the Klamath River at Weitchpec, the mainstem Trinity River is 170 miles long (Figure 4.4-1). The Trinity River basin encompasses approximately 2,965 square miles, about one-quarter of which is upstream of the TRD. Elevations in the basin range from 9,025 feet (msl) at Mount Eddy at the northeastern extremity of the watershed to 300 feet (msl) at the confluence of the Trinity and Klamath rivers. The climate is Mediterranean, with an average precipitation of 62 inches per year. Precipitation in the basin varies from 30 to 70 inches annually and typically occurs as rain in the lower elevations and snow in the higher elevations.

Construction of the TRD began in 1957, and storage of Trinity River water began in 1960. The Lewiston and Carr powerhouses commenced operation in April 1964. The TRD consists of a series of dams, tunnels, and powerplants that export water from the Trinity River basin into the Sacramento River basin. Trinity and Lewiston dams currently regulate Trinity River flows, particularly downstream of River Mile (RM) 112. With a capacity of 2.4 million acre-feet (maf), Trinity Lake is the largest component of the TRD. In order to regulate flow, discharges from Trinity Lake are held in Lewiston Reservoir prior to release downstream into the Trinity River. Lewiston Reservoir also acts as a forebay for the transbasin export of water into Whiskeytown Reservoir via the Clear Creek Tunnel. Since the TRD was constructed, Lewiston Dam has blocked access of anadromous salmonids to upstream habitat.

The 40-mile reach of the Trinity River downstream of Lewiston Dam is most affected by the changes in hydrologic regimes imposed by the TRD. Tributaries contribute relatively little accretion flow to this reach on an annual basis, although certain components of the annual hydrograph are locally modified by various tributary inflows (peak flows). Prior to authorization of the 2000 ROD for the Trinity River Mainstem Fishery Restoration EIS, the average annual flow volumes released from the TRD into the Trinity River at Lewiston Dam were reduced from pre-dam conditions by as much as 90 percent. Consequently, channel form and function in this reach have been substantially altered.

Source: Trinity River Flow Evaluation Report, 1999

Figure 4.4-1
Trinity River Basin Hydrology

Prior to the completion of the TRD, flows in the Trinity River were highly variable, ranging from summer flows of 25 cfs to extreme winter events with instantaneous peak flows higher than 100,000 cfs. The maximum recorded flow at Lewiston was 71,600 cfs in 1955. Annual hydrographs typically followed a seasonal pattern of high winter and spring flows followed by low summer and fall flows. Total annual flow volumes at Lewiston ranged from 0.27 to 2.7 maf, with an average of 1.2 maf.

From 1962 to 1979, CVP diversions delivered nearly 90 percent of the water from the TRD to the Sacramento River for urban and agricultural use[1]. After 1979, river releases were increased from 110,000 to 340,000 acre-feet (af) annually, substantially increasing the available flow to in the Trinity River during the period between 1979 and 2002 (ROD flows).

Although the 2000 ROD for the Trinity River Mainstem Fishery Restoration EIS established an annual volume based on water year types, litigation in federal court prevented implementation of the flow releases specified in the ROD in water years 2001–2004. Ultimately, the ROD was upheld, and the 2005 water year incorporated the schedule established by the TRRP in accordance with the ROD. This schedule is revised each year based on water year type. As the operator of the TRD, Reclamation is responsible for establishing the water year type each spring.

Increased water releases are periodically made from Trinity Dam consistent with Reclamation's safety of dams criteria intended to prevent overtopping of Trinity Dam. Although flood control is not an authorized purpose of the TRD, flood control benefits are provided through normal operations. Trinity Dam has limited release capacity below the spillway crest elevation. Studies completed by the USACE in 1974 and Reclamation in 1975 showed that the spillway and outlet works at Trinity Dam are not sufficient to safely pass the anticipated design flood inflow. For this reason, Reclamation implemented safety of dams criteria stipulating flood season release and storage criteria at Trinity Dam to reduce the potential for overtopping during large flood events. The safety of dams criteria attempt to prevent storage from exceeding 2.1 maf from November through March by prescribing reservoir releases when storage in Trinity Lake is forecast to exceed 2.0 maf during that period.

The safety of dams criteria specify that the Judge Francis Carr Powerplant be used as a first-preference destination for safety of dams releases made at Trinity Dam. Releases to the Trinity River are made as a second-preference destination. During significant northern California high-water or flood events, water stages in the Sacramento River are also of concern. Under such conditions, water that would otherwise move through the Carr Powerplant is routed to the Trinity River.

The flood season in the Trinity River basin is typically between October and April, when more than 90 percent of the annual precipitation falls. Floods on the Trinity River are controlled to some extent by the TRD. The greatest flood recorded for the area occurred in December 1955, although the ungaged flood of 1861–1862 likely exceeded all known historical events. Floods have also been recorded for the years 1926, 1928, 1937, 1940, 1941, 1948, 1950, 1958, 1960, 1963, 1964, 1972, 1974, and 1997 (Federal Emergency Management Agency 1996).

[1] The percentage of the Trinity River diverted to the CVP is the percentage of total reservoir release, not the percentage of the inflow.

From Lewiston Dam downstream to the Klamath River, a number of major tributaries provide accretion flows to the Trinity River. These tributaries include Rush Creek, Indian Creek, Weaver Creek, Canyon Creek, the North Fork Trinity River, Big French Creek, New River, South Fork Trinity River, Willow Creek, Horse Linto Creek, Tish Tang Creek, and Mill Creek.

The amount of winter precipitation in the basin increases steadily from east to west, as favorable orographic (related to, or caused by, physical geography) conditions extract more moisture from Pacific weather fronts closer to the coast and rain shadows reduce precipitation in the eastern portion of the watershed. Consequently, winter peak flows in the downstream portions of the Trinity River are much higher than in the upstream portions, with influence from the control of flows by the TRD greatly reduced. Trinity River flows at the Hoopa gage average about 10,000 cfs from January through March. A peak flow volume of 122,000 cfs was recorded at the Hoopa gage during the January 1997 flood, although less than 7,000 cfs was released from Lewiston Dam.

During the dry period following spring snowmelt, flow accretion and its influence on the hydrology of the mainstem Trinity River decreases dramatically. During summer and fall baseflow periods, tributary accretion flows contribute minimally to low release volumes from the TRD. In general, during low-flow periods, flow accretion is minimal from Lewiston Dam to Canyon Creek and becomes most significant downstream of the confluence with the North Fork Trinity River. However, during high flows (>10-year recurrence interval), tributary accretion substantially exceeds dam release flows within 15 to 20 miles downstream of Lewiston Dam (McBain and Trush 1997). Tributary flow influence on this reach during flood events and as a proportion of the high range of average daily flows is a reversal of pre-dam conditions, where mainstem flows would almost always exceed the contribution of tributaries. Despite tributary contributions, flood frequency and peak flows in the uppermost reaches of the mainstem below the TRD are greatly reduced compared to pre-dam conditions.

Groundwater

Most usable groundwater in the mountainous Trinity River basin occurs in widely scattered alluvium-filled valleys, such as those immediately adjacent to the Trinity River. These valleys contain only small quantities of recoverable groundwater and are therefore not considered a major source.

A number of shallow wells adjacent to the river provide water for domestic purposes. These infiltration wells are often located near the river and may be affected by spring ROD flow releases (i.e., up to 11,000 cfs). Consequently, the TRRP in cooperation with Trinity County has implemented the Trinity River Potable Water and Sewage Disposal System Assistance Program (Assistance Program) to allow qualifying landowners to relocate, replace, modify, or otherwise improve their potable water and sewage systems to better resist damage from ROD flows intended to benefit fisheries. The Assistance Program is a one-time only opportunity to receive financial assistance from the TRRP to ensure that ROD flows do not have negative effects on existing infrastructure and site improvements (e.g., water sources and wastewater disposal systems). To date, approximately 75 wells/septic systems have been improved and another 40 are planned for enhancement with TRRP funding. Additionally, there are a number of wells that are designed to be inundated, and often are, during the course of a water year.

Several community water systems use near-surface groundwater via intake galleries adjacent to the Trinity River. These systems include the Lewiston Community Services District, Lewiston Valley Water Company, and the Lewiston Park Mutual Water Company. BLM recreation sites at Douglas City and Junction City have reliable sources of potable water. No water service is available at the Steel Bridge recreation area.

Floodplain Hydrology and Hydraulics

Floodplain Hydrology

Within the 40-mile reach of the Trinity River below Lewiston Dam, the river has adjusted to a flow and sediment regime imposed in large part by the TRD. While the degree of berm development varies within the 40-mile reach, the river channel has been simplified over time. In general, the aquatic habitat in this reach of the river lacks complexity and is typified by a recurring sequence of pools, runs, glides, and low-gradient riffle habitat. Additional information on morphologic processes and aquatic habitat is provided in section 4.3 and section 4.6 of this document.

River flow hydrology estimates used for reach-level hydraulic modeling analyses have been derived from the following sources:

- Flood Plain Information Report: Trinity River, Lewiston Lake to Junction City, Trinity County, California (U.S. Army Corps of Engineers 1976);
- Flood Insurance Study (FIS) for Trinity County (Federal Emergency Management Agency 1996);
- Estimation of 50- and 100-Year Tributary Accretion Floods: Lewiston Dam to Treadwell Bridge, Trinity River, California (McBain and Trush 2002); and
- Trinity River, California Flood Plain Infrastructure Modifications Spring Flow Events (Bureau of Reclamation 2005).

The 1976 USACE report provides the 100-year and 500-year annual flood flow estimates and hydraulic analyses used by FEMA to develop the current flood insurance rate maps (FIRMs) for the Trinity River. However, this report provides flow rates only at Lewiston, Douglas City, and Junction City.

The 2002 McBain and Trush report provides flood flows as measured at mainstem Trinity River gages during the January 1997 flood and estimates of tributary accretion between mainstem gages during this event. This report was used to approximate how flows would have accumulated between gage locations if the flood assumed in the 1976 study were similar to the 1997 flood. The 2005 Bureau of Reclamation Spring Flow Events Study provides an estimate of 10-year and 100-year spring tributary flows during the period when maximum fishery flows (11,000 cfs) would be released from Lewiston Dam. The Reclamation study provides the most current and best available hydrology for the reach. Estimated flows from the 2005 Reclamation study and the 1976 USACE report are provided in Table 4.4-1.

Table 4.4-1. Estimated Trinity River Flows by Location

Location (below confluence)	Maximum Fishery Flow (cfs) + 10-year Spring Tributary Flow[a]	Maximum Fishery Flow (cfs) + 100-year Spring Tributary Flow[a]	FEMA 100-Year Flood[b]
Lewiston Release	11,000	11,000	8,500
Deadwood Creek	11,070	11,219	
Rush Creek	11,433	12,096	
Grass Valley Creek	12,248	13,962	
Limekiln/China Gulch	12,543	14,226	
Indian Creek	13,316	15,771	38,500
Weaver Creek	14,177	17,544	
Reading Creek	14,697	18,613	
Browns Creek	16,020	21,336	
Dutch Creek	16,233	21,736	
Canyon Creek	17,028	23,207	46,000
North Fork Trinity	17,612	23,854	

[a] 2005 Bureau of Reclamation (Technical Service Center) Maximum Fishery Flow (MFF) + Spring Tr butary Flow Study

[b] 1976 USACE Report & 1996 FEMA Flood Insurance Study for Trinity County

The information provided in Table 4.4-1 indicates that the annual hydrograph is influenced by accretion flow from tributaries, which augments TRD releases. The timing of peak flow and ramping-down releases under the ROD corresponds to the typical annual period of peak snowmelt floods in the watershed for each of the water year classes described in the ROD.

A number of major tributaries enter the Trinity River within the 40-mile reach below Lewiston Dam. Rehabilitation sites are located near the confluences of most major tributaries, including Rush Creek, Reading Creek, Sheridan Creek, Dutch Creek, Soldier Creek, and Canyon Creek

Floodplain Hydraulics

The best available hydraulic analysis for the Trinity River is the Trinity River Hydraulic Flow Study: North Fork Trinity to Lewiston Dam, developed by the California Department of Water Resources (DWR) for the TRRP using flow data from the 2005 Bureau of Reclamation study (California Department of Water Resources 2007). The study used the USACE Hydraulic Engineering Center's River Analysis System (HEC-RAS) software to develop the hydraulic model. HEC-RAS is a one-dimensional, steady flow hydraulic model developed for use in channel flow analysis and floodplain determination and is considered the industry standard. An output of the HEC-RAS model is water surface elevations (WSEs) that are widely used for floodplain management and flood insurance studies.

The DWR study summarizes flow modeling of the mainstem Trinity River from Lewiston Dam to its confluence with the North Fork Trinity River, 40 miles downstream. The model estimates WSEs based on a controlled flow release of 11,000 cfs from Lewiston Reservoir with 10-year and 100-year spring tributary flows. The TRRP has defined the 11,000 cfs release plus 100-year spring tributary flow event as the Maximum Fishery Flow (MFF) for project planning and risk assessment purposes. Currently, all existing structures within the MFF inundation zone have been structurally improved, relocated, or otherwise addressed by the TRRP to allow this flow to be implemented.

The HEC-RAS hydraulic model allows a preliminary evaluation of risks to Trinity River properties by comparing the WSE of the proposed rehabilitation project's design conditions with the existing conditions. The comparison indicates how the features of the Proposed Project could affect the base flood elevation (BFE) estimated by FEMA for the 100-year flood. One of the design criteria has been developed to ensure that none of the proposed activities would result in an obstruction to flow or an increase in the BFE of more than 12 inches.

The Proposed Project would result in a significant impact related to hydraulics if one of the following conditions occurred:

- an increase of more than 12 inches in the base flood elevation;
- substantial alteration of the existing drainage pattern of a site or area, including the alteration of the course of a stream or river, or substantial increase in the rate or amount of surface runoff in a manner that would result in flooding on- or off-site; or
- exposure of people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

Floodplain Corridor

The floodplain of the Trinity River is identified in FEMA's Flood Insurance Study, Trinity County, California, and Incorporated Areas (1996). Actual floodplain designations are in the accompanying Flood Insurance Rate Map (FIRM). The countywide FIRM map became effective on August 16, 1988, and was updated in 1996.

The FIRM map as it relates to the Proposed Project, including the 100-year floodplain, is shown in Figure 4.4-2. The floodplain designations for the Trinity River between Lewiston and Helena were identified from a flood study performed by the USACE (U.S. Army Corps of Engineers 2004). Because there have been changes in channel morphology and estimated hydrology since the 1996 FEMA Flood Insurance Study, DWR's modeling of the MFF provides the best available basis for evaluating Trinity River flows from Lewiston Dam to the North Fork Trinity River. Near the dam (e.g., upstream of Rush Creek), the MFF exceeds the BFE (Table 4.4-1).

Except for some upland areas, the project boundaries are within the 100-year floodplain designated by FEMA and within Special Flood Hazard Area Zones A, AE, X, and X500. Zone A is the flood insurance rate zone inundated by 100-year flooding for which no BFE (or depth of inundation) has been determined. Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that were determined by detailed analyses in the Flood Insurance Study. Lenders require flood insurance within both Zones A and AE (Zone AE simply has a detailed study that defines the zone). Zone X is the flood insurance rate zone that correspond to areas outside the 100-year floodplains, areas of 100-year sheet flow flooding where average depths are less than 1 foot, areas of 100-year stream flooding where the contributing drainage area is less than 1 square mile, or areas protected from the 100-year flood by levees.

No BFEs or depths are shown within this zone. Zone X500 is an area between the 100 and 500-year flood zone.

Recent studies elsewhere on the river indicate that the flood magnitude determined by the 1976 USACE study may underestimate the actual flood magnitude and, therefore, the extent of the floodplain. As this project and other TRRP rehabilitation projects are implemented in the future, updated hydrological and topographical information could be used to revise the flood insurance study and flood insurance rate maps. This issue will be addressed at the appropriate time by FEMA and Trinity County.

Chapter 2 provides a discussion of the hydraulic analysis of WSEs and channel velocities for design flows prescribed in the ROD. This analysis was used to ensure that the Proposed Project and Alternative 1 incorporate the design elements required for compliance with the County’s Floodplain Management Ordinance.

4.4.2 Environmental Impacts and Mitigation Measures

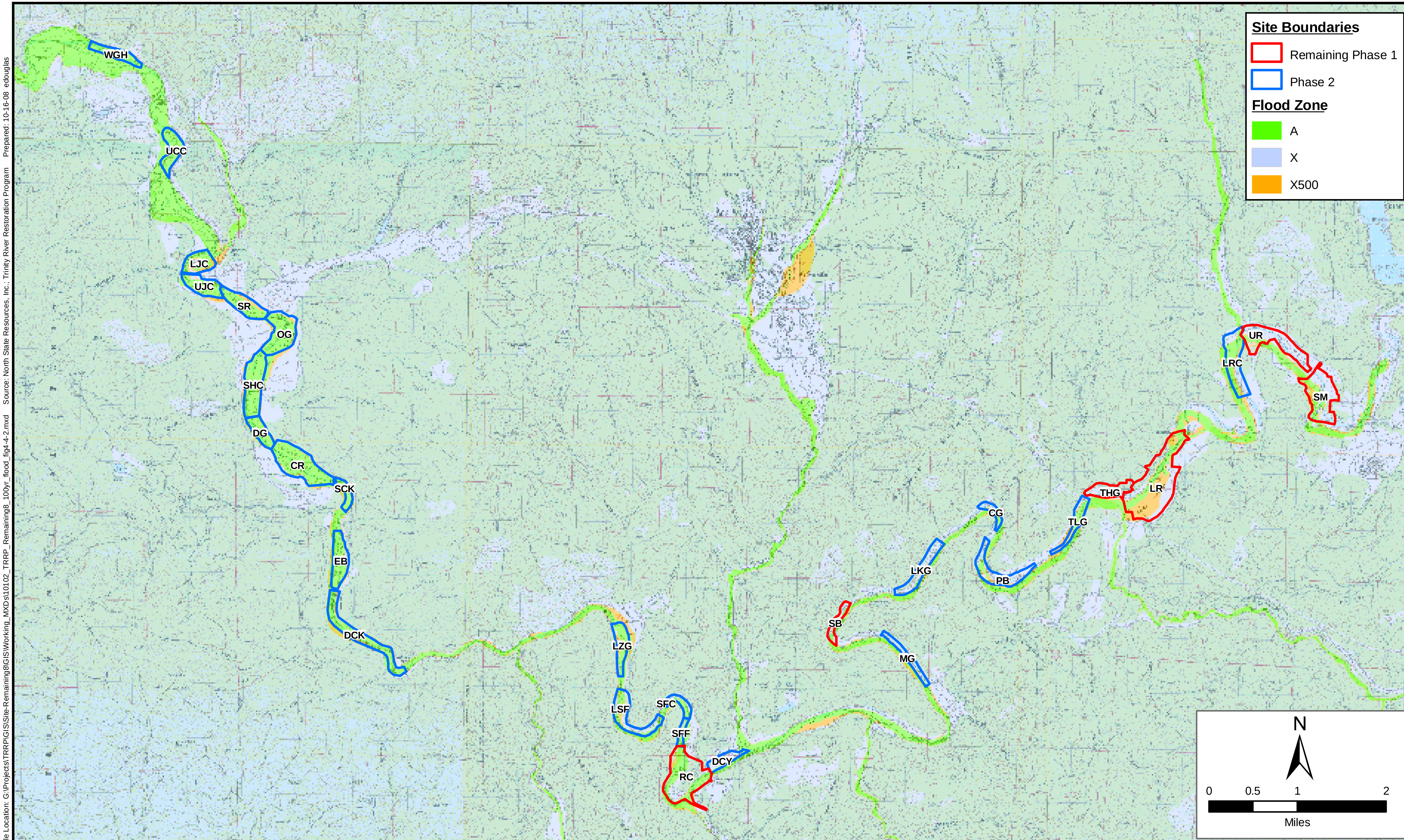
Methodology

Hydraulic models allow the preliminary evaluation of risks to Trinity River properties by comparing the WSE of the Proposed Project’s design conditions with the existing conditions. The comparison indicates how the features of the Proposed Project could affect the BFE estimated by FEMA for the 100-year flood. One of the design criteria for the Proposed Project was developed to ensure that none of the proposed activities would result in an obstruction to flow or an increase in the BFE of more than 12 inches.

Significance Criteria

The Proposed Project would have a significant impact related to water resources if one of the following conditions occurred:

- It could subject people, structures, or other resources to substantial changes in flood hazards.
- It would result in modification of groundwater resources.



North State Resources, Inc.

Trinity River Restoration Program: Phase 1 and Phase 2 Sites

Figure 4.4-2
100-year Floodplain and Flood Insurance Rate Map

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The Proposed Project would result in a significant impact related to hydraulics if one of the following conditions occurred:

- The base floodwater surface elevation would increase by more than 1 foot.
- There would be a substantial alteration of the existing drainage pattern of a site or area, including the alteration of the course of a stream or river, or a substantial increase in the rate or amount of surface runoff in a manner that would result in flooding on- or off-site.
- It would expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

The Proposed Project would result in a significant impact to groundwater if one of the following conditions occurred:

- There would be a long-term decline in groundwater elevations (or a net reduction in groundwater storage) due to interference with recharge.
- There would be detectable land subsidence.
- Any water quality standards or waste discharge requirements intended to protect groundwater quality would be violated.
- There would be a detectable degradation of groundwater quality.

Groundwater impacts were assessed at the scale of a groundwater basin or sub-basin. The significance of declining (or increasing) water levels depends in part on the duration and permanence of the impact. Because groundwater elevations fluctuate naturally due to changes in rainfall, short-term changes in groundwater elevations are not considered significant impacts.

Impacts and Mitigation Measures

Table 4.4-2 summarizes the potential impacts related to water resources that could result from construction of the project.

Table 4.4-2. Summary of Water Resources Impacts for the No-Project Alternative, Proposed Project, and Alternative 1

No-Project Alternative	Proposed Project	Alternative 1	Proposed Project with Mitigation	Alternative 1 with Mitigation
Impact 4.4-1. Implementation of the project could result in a temporary or permanent increase in the BFE.				
No Impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]

Table 4.4-2. Summary of Water Resources Impacts for the No-Project Alternative, Proposed Project, and Alternative 1

No-Project Alternative	Proposed Project	Alternative 1	Proposed Project with Mitigation	Alternative 1 with Mitigation
Impact 4.4-2. Implementation of the project could result in a permanent decline in groundwater elevations or a permanent change in groundwater quality.				
No Impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]
Impact 4.4-3. Implementation of the project would expose people or structures to a significant risk of injury, death, or loss involving flooding or erosional processes.				
No Impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]

[1] Because this impact is less than significant, no mitigation is required.

Impact 4.4-1: Implementation of the project could result in a temporary or permanent increase in the BFE. ***No impact for the No-Project Alternative; less-than-significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, the Trinity River floodplain would not be altered by any of the activities described in Chapter 2. The existing BFEs would not increase because the project would not be constructed. Therefore, there would be no impact.

Proposed Project and Alternative 1

Under either action alternative, the elevation and extent of the floodplain of the Trinity River would be modified through the activities associated with both Remaining Phase 1 and Phase 2 sites, as described in Chapter 2. At the Remaining Phase 1 sites, the preliminary hydraulics analysis indicates that removing all the excavated material from the riverine rehabilitation areas and placing it as coarse sediment within the channel or above the BFE in upland activity areas would not result in an increase in the FEMA BFE. Additionally, the analysis indicates that there would be no increase in the FEMA BFE from the placement of low-flow channel crossings at the Remaining Phase 1 sites.

Although a hydraulic model has been developed to assist in the initial planning efforts for the Phase 2 sites, the conceptual nature of the activities at these sites precludes conducting site-specific hydraulic analysis. Final site-specific hydraulic analyses would be performed prior to implementing any of the alternatives. In any case, the action alternatives described in Chapter 2 would be consistent with the overall project objectives and design criteria established by the TRRP and the Regional Water Board. Therefore, the impact would be less than significant.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.4-2: Implementation of the project could result in a permanent decline in groundwater elevations or a permanent change in groundwater quality. ***No impact for the No-Project Alternative; less-than-significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, none of the activities identified in Chapter 2 would be implemented, although Reclamation would continue to implement other elements of the ROD, including the development of annual flow recommendations and ongoing implementation of the Assistance Program. No effects on local groundwater levels would occur because the project would not be constructed. Therefore, there would be no impact.

Proposed Project and Alternative 1

The displacement of channel and floodplain materials has only a minimal potential to change the groundwater hydraulics within the boundaries established for the Remaining Phase 1 and Phase 2 sites under the Proposed Project and Alternative 1. Groundwater table elevations and water volumes in nearby off-channel wetlands would not be affected because groundwater elevations in these areas are associated with river stage. The tendency of the surface water–groundwater system to move to equilibrium conditions and the overall absence of impacts to the regional driving mechanisms of groundwater recharge (seasonal precipitation and Trinity River flow regimes) suggest that no long-term impacts on water table elevations would occur. Therefore, this impact would be less than significant.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.4-3: Implementation of the project would expose people or structures to a significant risk of injury, death, or loss involving flooding or erosional processes. ***No impact for the No-Project Alternative; less-than-significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, none of the activities identified in Chapter 2 would be implemented, although Reclamation would continue to implement other elements of the ROD, including the development of annual flow recommendations and ongoing implementation of the Assistance Program. No people or structures would be exposed to flood risks associated with the Proposed Project because the project would not be constructed. Therefore, there would be no impact.

Proposed Project and Alternative 1

Neither the Proposed Project nor Alternative 1 would result in activities intended to increase the BFE at the Remaining Phase 1 or Phase 2 sites. Activities intended to modify the bed and banks of the Trinity River could have ancillary impacts to the bed and banks downstream. To date, the TRRP staff has identified several locations downstream of activity areas where the bank of the river appears to be responding to post-ROD changes in the flow and sediment regime.

While the fundamental objective of the activities associated with either the Proposed Project or Alternative 1 is to reestablish the alluvial features of the river, isolated instances of bank erosion may result in the loss of river bank and associated vegetation or, to a lesser extent, constructed features such as wells, utilities, and landscape features. In addition to the TRRP assistance program for water and sewer, bank stabilization measures, specifically the bio-engineering measures described in Chapter 2, are intended to address these impacts on a case-by-case basis, consistent with all federal, state, and local requirements. In concert with the ongoing TRRP program and the activities described in Chapter 2, both of the action alternatives are designed to avoid exposing people or structures to a significant risk of injury, death, or loss involving flooding. Therefore, this impact would be less than significant.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

SECTION 4.5

Water Quality

4.5 Water Quality

This section describes water quality conditions in the vicinity of the proposed channel rehabilitation sites along the Trinity River. It also evaluates potential impacts to water quality from implementation of the Proposed Project.

The principal components of the Trinity River Division (TRD) are Lewiston Dam, Trinity Dam, and the facilities that divert runoff from the Trinity River watershed to the Sacramento River basin. Prior to full implementation of the ROD, up to 90 percent of the natural Trinity River flow was diverted, which substantially altered water quality in the Trinity River, particularly its temperature and sediment regimes. Additional information on this topic is provided in section 4.4, Water Resources, and section 4.6, Fisheries.

4.5.1 Environmental Setting

Water Quality Management

Basin Plan

The Proposed Project is subject to compliance with the Water Quality Control Plan for the North Coast Region (Basin Plan). The Basin Plan covers all basins, including the Lower Klamath Lake and Lost River basins, draining into the Pacific Ocean from the California-Oregon state line south to the southern boundary of the Estero de San Antonio/Stemple Creek watershed in Marin and Sonoma counties. The Trinity River is the largest tributary to the Klamath River. Section 4.4, Water Resources, provides additional discussion of the Trinity River and the tributaries that influence the rehabilitation sites.

The beneficial uses for the Trinity River defined in the Basin Plan are listed in Table 4.5-1. This table also shows whether these beneficial uses already exist or whether they have the potential to exist.

Table 4.5-1. Trinity River Beneficial Uses

Beneficial Water Uses	Existing or Potential
Municipal and domestic supply	Existing
Agricultural supply	Existing
Industrial service supply	Potential
Industrial process supply	Potential
Groundwater recharge	Existing
Freshwater replenishment	Existing
Navigation	Existing
Hydropower generation	Potential
Water contact recreation	Existing
Non-contact water recreation	Existing
Commercial and sport fishing	Existing

Table 4.5-1. Trinity River Beneficial Uses

Beneficial Water Uses	Existing or Potential
Cold freshwater habitat	Existing
Wildlife habitat	Existing
Rare, threatened, or endangered species	Existing
Migration of aquatic organisms	Existing
Spawning, reproduction, and/or early development	Existing
Aquaculture	Potential and existing

Source: North Coast Regional Water Quality Control Board 2007

In addition to municipal and domestic water supply, the beneficial uses affected by the water quality of the Trinity River are primarily those associated with supporting high-quality habitat for fish. Recreation (contact and non-contact) is another important beneficial use potentially affected by various water quality parameters (e.g., sediment and temperature). Recreation activities in and adjacent to the rehabilitation sites include whitewater recreation, fishing, swimming, and sightseeing.

The Basin Plan identifies both numeric and narrative water quality objectives for the Trinity River. Table 4.5-2 summarizes the water quality objectives for each of the categories that have been established by the Regional Water Board to protect designated beneficial uses.

In addition to water quality objectives, the Basin Plan includes two waste discharge prohibitions that pertain to logging, construction, and associated nonpoint source activities, as follows:

- The discharge of soil, silt, bark, sawdust or other organic and earthen material from any logging, construction, or associated activity of whatever nature into any stream or watercourse in the basin in quantities deleterious to fish, wildlife, or other beneficial uses is prohibited.
- The placing or disposal of soil, silt, bark, slash, sawdust, or other organic and earthen material from any logging, construction, or associated activity of whatever nature at locations where such material could pass into any stream or watercourse in the basin in quantities deleterious to fish, wildlife, or other beneficial uses is prohibited.

Two additional documents address specific elements of water quality in the Trinity River basin. The Interim Action Plan for the Trinity River incorporated into the Basin Plan addresses flow and temperature issues in the portion of the river affected by the TRD. The Trinity River Total Maximum Daily Load (TMDL) for Sediment (U.S. Environmental Protection Agency 2001) identifies the total load of sediment that can be delivered to the Trinity River and its tributaries without exceeding water quality standards, based on projected flows.

Table 4.5-2. Water Quality Objectives for the Trinity River

Category	Objective Threshold	Applicable Portion of Water Body
Bacteria	The bacteriological quality of waters of the North Coast region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following: In waters designated for contact recreation, the median fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed 50/100 milliliters (ml), nor shall more than 10 percent of total samples during any 30-day period exceed 400/100 ml.	Entire Trinity River
Biostimulatory substances	Water shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.	Entire Trinity River
Color	Water shall be free of coloration that causes nuisance or adversely affects beneficial uses.	Entire Trinity River
Chemical constituents	Waters designated for use as domestic or municipal supply shall not contain concentrations of chemical constituents in excess of the limits specified in the California Code of Regulations (CCR).	Entire Trinity River
Dissolved oxygen	Shall not be depressed below 8.0 mg/L and 50 percent or more of the monthly means for a calendar year must be greater than or equal to 10 mg/L.	Lower Trinity River
Floating material	Water shall not contain floating material, including solids, liquids, foams, and scum in concentrations that cause nuisance or adversely affect beneficial uses.	Entire Trinity River
Oil and grease	Waters shall not contain oils, greases, waxes, or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.	Entire Trinity River
pH	Shall not be depressed below 7.0 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses.	Entire Trinity River
Pesticides	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. There shall be no bioaccumulation of pesticide concentrations found in bottom sediments or aquatic life. Waters designated for use as domestic or municipal supply shall not contain concentrations of pesticides in excess of the limiting concentrations set forth in the CCR.	Entire Trinity River

Table 4.5-2. Water Quality Objectives for the Trinity River

Category	Objective Threshold	Applicable Portion of Water Body
Radioactivity	Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life, nor which result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or indigenous aquatic life. Waters designated for use as domestic or municipal supply shall not contain concentrations of radionuclides in excess of the limits specified in the CCR.	Entire Trinity River
Sediment	The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.	Entire Trinity River
Settleable material	Water shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.	Entire Trinity River
Suspended material	Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.	Entire Trinity River
Tastes and odors	Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.	Entire Trinity River
Temperature	At no time or place shall the temperature of any COLD water be increased by more than 5 °F above the natural receiving water temperature.	Entire Trinity River
Toxicity	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	Entire Trinity River
Turbidity	Turbidity shall not be increased more than 20 percent above naturally occurring background levels. Allowable zones of dilution within which higher percentages can be tolerated may be defined for specific discharges upon the issuance of discharge permits or waiver thereof.	Entire Trinity River

Source: North Coast Regional Water Quality Control Board 2007

Trinity River Water Quality

The releases from the TRD influence flow volumes and velocities, water quality, and channel geometry downstream of Lewiston Dam. These influences are particularly important to water quality parameters such as temperature, turbidity, and suspended sediments. A dramatic decrease in the abundance of Trinity River coldwater fishes has taken place since the TRD began operation (U.S. Fish and Wildlife Service and Hoopa Valley Tribe 1999).

Water quality in the Trinity River may also be affected by acid mine drainage from abandoned mines and past mining activities, sediment releases from land use practices associated with unstable soils and decomposed granite (e.g., roads, vegetation management, and subdivisions), septic tanks, aboveground and underground storage tanks, and lumber mills (North Coast Regional Water Quality Control Board 2005).

Disturbances, primarily fires, floods, and landslides, are a natural part of the riverine ecosystem that directly influence water quality and, therefore, beneficial uses. The beneficial uses associated with salmonid species are subject to natural fluctuations in water quality in response to disturbances. Anthropogenic (human-caused) activities can affect the severity and frequency of these disturbance processes.

Temperature

The influence of Trinity Lake and Lewiston Reservoir on downstream conditions diminishes with distance. In general, the greater the release volumes from Lewiston Dam, the less susceptible the river's temperature is to other factors. Releases from Trinity Dam are generally cold (42 to 47 ˚F). These temperatures are transmitted through Lewiston Reservoir to the Trinity River below Lewiston Dam.

The Basin Plan (North Coast Regional Water Quality Control Board 2007) defines temperature objectives that apply to the Trinity River. These objectives are effective from July 1 through December 31 for the 40-mile reach between Lewiston Dam and the North Fork Trinity River. Table 4.5-3 lists these objectives; the Basin Plan also stipulates that water released into the Trinity River may be no more than 5 °F warmer than receiving water temperatures.

Table 4.5-3. Temperature Objectives for the Mainstem Trinity River

Daily Average Temperature Not to Exceed	Period	Trinity River Reach
60 °F (15.6 °C)	July 1 – September 14	Lewiston Dam to Douglas City Bridge
56 °F (13.3 °C)	September 15 – October 1	Lewiston Dam to Douglas City Bridge
56 °F (13.3 °C)	October 1 – December 31	Lewiston Dam to confluence with North Fork

Source: North Coast Regional Water Quality Control Board 2007

Sediment

In 1992, the EPA added the Trinity River to its list of impaired rivers under the provisions of Section 303(d) of the CWA in response to a determination by the State of California that the water quality standards for the river were exceeded due to excessive sediment. In 2001, the EPA established a TMDL for sediment in the river. The Regional Water Board has continued to identify the Trinity River as impaired in subsequent listing cycles. The primary adverse impacts associated with excessive sediment in the Trinity River pertain to degradation of habitat for anadromous salmonids.

The restriction of streamflows downstream of the TRD has greatly contributed to the impairment of the Trinity River below Lewiston Dam (U.S. Environmental Protection Agency 2001). The reduction in available coarse sediment upstream of Rush Creek and the significant contribution of fine sediment from Grass Valley Creek have combined to severely affect the sediment flux and particle size distribution in the river. These effects are observable downstream at both the Remaining Phase 1 and the Phase 2 sites throughout the 40-mile reach.

The magnitude, timing, duration, and frequency of sediment delivery in the Trinity River watershed have considerable inherent inter-annual and seasonal variability. Because of this variability, the TMDL and load allocation are designed to apply to sources of sediment rather than the movement of sediment across the landscape and to estimate average sediment input using a 10-year rolling average. The TMDL also takes into account critical conditions for flow, sediment loading, and water quality parameters.

In order to alleviate the adverse impacts associated with excessive sediment in the Trinity River, a number of projects have been implemented to control and reduce input of excessive fine sediments into the Trinity River from tributary streams, including Grass Valley Creek, Rush Creek, and Deadwood Creek. The DWR constructed the upper and lower Hamilton Ponds on DWR property at the mouth of Grass Valley Creek in 1988 and 1989. Reclamation constructed the Buckhorn Sediment Dam in 1990 on BLM managed lands in the upper Grass Valley Creek watershed. In combination, these sediment-retention structures minimize fine sediment output from Grass Valley Creek. The Hamilton Ponds are located immediately downstream of two Remaining Phase 1 sites, LR and THG, near the confluence of Grass Valley Creek. Since the construction of the sediment-retention structures, other measures, including revegetation, bioengineering, grade stabilization, and sediment capture, have been implemented in the Grass Valley Creek watershed to further reduce the amount of soil erosion and transport of sediment. Recent efforts to reduce sediment input into the Trinity River include sediment reduction projects in the Deadwood Creek watershed and periodic excavation and removal of fine sediments from the Hamilton Ponds.

With implementation of ROD flows and placement of coarse sediment in the Lewiston area, local reductions in fine sediment in the river bed have been observed and fish spawning has increased. Direct measurements to compare in-channel fine sediment concentrations pre- and post-ROD flows have not been completed.

Turbidity

The Basin Plan (North Coast Regional Water Quality Control Board 2007) contains water quality objectives to protect present and probable future beneficial uses of water and to protect existing high quality waters of the State. Water quality objectives form the basis for establishment of waste discharge permits. The Basin Plan contains a water quality objective for turbidity that applies to the Trinity River, including the Remaining Phase 1 and Phase 2 sites described in Chapter 2. The water quality objective for turbidity states, “Turbidity shall not be increased more than 20 percent above naturally occurring background levels. Allowable zones of dilution within which higher percentages can be tolerated may be defined for specific discharges upon issuance of discharge permits or waiver thereof.” An allowable zone of turbidity dilution is an area within water where turbidity discharges may increase the naturally occurring turbidity level by more than 20 percent. An allowable zone of turbidity dilution may only be granted in waste discharge permits if all beneficial uses (Table 4.5-1) remain protected.

The turbidity level in a water body is related to the concentration of suspended solids, which are predominantly less than 0.5 millimeter (mm) in diameter. Water clarity has historically been measured as the concentration of suspended solids (mg/l) or more recently as turbidity, which is measured in nephelometric turbidity units (NTUs). Turbidity generally does not cause acute adverse affects to aquatic organisms unless concentrations are extremely high (Lloyd 1985). Noggle (1978) estimated an acute lethal concentration causing 50 percent mortality of juvenile coho salmon at 1,200 mg per liter (mg/L) during summer (approximately 900 NTU). At relatively high levels, suspended solids can adversely affect the physiology and behavior of aquatic organisms and may suppress photosynthetic activity at the base of food webs, affecting aquatic organisms either directly (e.g. ability to feed) or indirectly (e.g. impact to food supply or spawning substrate) (Alabaster and Lloyd 1980). However, at lower levels, effects of turbidity last as long as the perturbation in clarity and are limited to reducing reactive distance to prey as well as predation risk. For instance, if periods of increased turbidity occur during periods of merganser (fish predator) activity, the turbidity would probably be used as protective cover that would provide an overall benefit to the fish (Harvey, pers. comm. 2009). In the lab, benthic feeding success of coho salmon in water with turbidity levels as high as 100 NTU has been found to be at least 70 percent of their feeding success in clear water (Harvey and White 2008). During low flow restoration activities, adult salmon have been observed using the more turbid sections of the river (10 to 15 NTU) as protective cover during their spawning migrations through the project areas (Gutermuth, pers. obs.). Finally, the Alaska Department of Environmental Conservation (2008) has determined that turbidity levels for protection of aquaculture in flowing conditions may not exceed 25 NTUs above natural conditions, and that this level is protective of fishery resources.

The Trinity River is typically very clear with natural background turbidity levels in the range of 0 to 1 NTU during summer low flow conditions. Due to the very low background concentrations during the summer, turbidity levels immediately downstream of the most carefully planned and implemented in-channel restoration activities will likely be increased by more than 20 percent above background levels, and plumes extending downstream of restoration activities may be visible. However, short-term increases in turbidity levels that occur during permitted restoration activities are generally not considered to be biologically detrimental to aquatic organisms; they are short in duration and fish are able to move away from the activity area. Reduction of these turbidity levels to within 20 percent above background is very expensive if not impossible using best management practices. Monitoring turbidity increases during implementation of previous Trinity River restoration projects has shown that periods of increased turbidity are brief (generally less than 24 hours); turbidity levels have not exceeded 50 NTU at monitoring points located 500 feet downstream and beneficial uses were still protected. In addition, the quantity of fine sediment introduced to the river during low flow restoration activities is typically small.

In contrast, sediment particles between 0.5 mm and 8.0 mm in diameter tend to settle more quickly. These larger sediment particles can decrease the permeability of the channel bed and cover spawning sites, causing negative impacts on the aquatic community (U.S. Fish and Wildlife Service and Hoopa Valley Tribe 1999). However, so long as the larger sediment particles are only mobilized into the water column from completed restoration activity areas and off-site sources during high flows, the larger sediment particles will be transported far down-river or deposited on adjacent alluvial features (e.g., floodplains) where these particles contribute to riparian form and function (e.g., plant growth).

Post construction monitoring data from the Indian Creek site and the Canyon Creek Suite of sites indicate that downstream turbidity levels may be increased by overland flow during the initial high flow events that occur following the completion of construction activities. During high flow spring-time releases from Lewiston Dam (e.g., clear water released from the dam during ROD flows), turbidity levels may be increased by more than 20 percent at monitoring locations that are 500 feet or more downstream of recently completed channel rehabilitation sites. However, when the high flows are caused by natural storm water runoff in the Trinity River basin, and the river is already carrying a substantial sediment load (e.g., turbidity greater than 40 NTUs), background levels are generally not increased by more than 20 percent at monitoring locations downstream of recently completed activities. Furthermore, during natural high flow events the relative addition of fine sediment from recently completed channel rehabilitation sites is minimal compared to the sediment load already being transported by the river (Gutermuth, pers. obs.). In both of these high flow scenarios, impacts to the Trinity River from the addition of TRRP related fine sediment is minimal because the materials that increase turbidity levels are maintained in suspension and transported downriver or deposited on the floodplain in the same manner as fine sediment from other sources. In both low flow and high flow scenarios, as long as project related turbidity level increases are limited in concentration and duration, impacts to aquatic life and beneficial uses are expected to be minimal in comparison to the long-term aquatic habitat benefits that these projects are designed to create.

Mercury

Another source of potential water quality impairment of the Trinity River is mercury. Although the river is not listed under Section 303(d) of the CWA for mercury impairment, elevated concentrations have been found in water, sediment, and biota (i.e., fish, frogs, and predatory aquatic insects) in the upper Trinity River basin upstream of Lewiston Dam (U.S. Geological Survey, unpublished data). Biological samples taken from the Trinity River downstream of Lewiston Dam (40-mile reach) have not yielded significantly elevated levels of mercury in biota from various trophic levels to date; however, studies that focus on the river downstream of the TRD and specifically at TRRP mechanical channel rehabilitation projects constructed over the past several years are ongoing. The general significance of mercury as a biological toxin and the likely sources of mercury in regional and local contexts are discussed in section 4.13, Hazards and Hazardous Materials.

Early in the planning phases for the mechanical channel rehabilitation projects along the Trinity River, the TRRP recognized the possibility that mercury in placer tailings and/or fluvial fine sediments could be disturbed and mobilized by the rehabilitation activities. The USGS has been monitoring mercury levels at the TRRP Hocker Flat site; the monitoring suggests that the alluvial materials that are subject to project-related disturbance contain levels of mercury well below the numeric criteria promulgated by the EPA for priority toxic pollutants. The levels are also well below the narrative threshold, which states that toxic substances should not be in such concentrations that they produce detrimental physiological responses in humans or aquatic life. Furthermore, sequential chemical extraction testing of placer tailings and floodplain sediment containing from 24 to 104 ng/g (parts per billion (ppb)) mercury has found that mercury concentrations in water that leached through sediments were very low, ranging from 1.1 to 4.2 ng/L (parts per trillion (ppt)) (U.S. Geological Survey, unpublished data). Under the California Toxics Rule, the numeric water quality criteria for mercury (total recoverable) in inland surface waters is 50 ppt. The mercury concentrations in the waters of the Trinity River downstream of the TRD were found to be well below the water quality objective under all flow regimes, both prior to and after the completion of channel rehabilitation activities at the Hocker Flat and Canyon Creek sites (Rytuba et al. 2005). Overall, the U.S. Geological Survey's assessment of site-specific methylation data suggests that the bioavailability of mercury in the Trinity River and its floodplain is not presently high and will not likely be modified by the activities described in Chapter 2.

4.5.2 Environmental Impacts and Mitigation Measures

Methodology

Impacts on water quality were determined by analyzing whether the proposed modification of the physical features and biological conditions at the Remaining Phase 1 and Phase 2 sites would comply with Basin Plan objectives for the Trinity River. Although the Phase 2 sites are described in a conceptual manner, the type and magnitude of the activities that would be implemented are similar to those described for the Remaining Phase 1 sites in Chapter 2.

Significance Criteria

The Proposed Project would result in significant adverse impacts if it would result in any of the following:

- violations of state or federal numerical water quality standards or state or federal narrative water quality objectives;
- substantial degradation of water quality, such that existing beneficial uses are precluded specifically because of degraded water quality;
- violation of any waste discharge requirements and/or Section 401 Certification conditions;
- substantial alterations of the course of a stream or river in a manner that would result in substantial erosion or siltation onsite or offsite; or
- violation of site-specific temperature objectives for the Trinity River contained in the Water Quality Control Plan for the North Coast Region (North Coast Regional Water Quality Control Board 2007) and included as Table 4.5-3 of this document.

Impacts and Mitigation Measures

Table 4.5-4 summarizes the potential water quality impacts resulting from construction and operation of the project.

Table 4.5-4. Summary of Water Quality Impacts for the No-Project Alternative, Proposed Project, and Alternative 1

No-Project Alternative	Proposed Project	Alternative 1	Proposed Project with Mitigation	Alternative 1 with Mitigation
Impact 4.5-1. Construction of the project could result in short-term, temporary increases in turbidity and total suspended solids levels during construction.				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.5-2. Construction of the project could result in short-term, temporary increases in turbidity and total suspended solids levels following construction.				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.5-3. Construction of the project could cause contamination of the Trinity River from hazardous materials spills.				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.5-4. Construction of the project could result in increased stormwater runoff and subsequent potential for erosion.				
No impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]
Impact 4.5-5. Construction and maintenance of the project could result in the degradation of Trinity River beneficial uses identified in the Basin Plan.				
No impact	Significant	Significant	Less than significant	Less than significant

[1] Because this impact is less than significant, no mitigation is required.

Impact 4.5-1: Construction of the project could result in short-term, temporary increases in turbidity and total suspended solids levels during construction. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, no construction-related short-term increases in turbidity or total suspended solids levels would occur because the project would not be constructed. Therefore, there would be no impact.

Proposed Project

Under the Proposed Project, the activities at the rehabilitation sites described in Chapter 2 would temporarily increase turbidity and total suspended solids in the Trinity River. The incorporation of design elements and construction criteria described in Chapter 2 (e.g. in-river construction, water pollution prevention, and construction schedules) are intended to limit the total addition of fine suspended sediment to the Trinity River. Additionally, river's edge and in-channel construction activities will be staged to minimize the potential turbidity effects. During in-channel construction activities, increases in turbidity levels could occur because of excavation of alluvial material. The removal of grade control features will result in short-term increases in turbidity levels as this material is removed from and/or redistributed within the channel. Fine sediments may be suspended in the river for several hours following construction activities. The extent of downstream sedimentation would be a function of the size and mobility of the substrate. For example, fine-grained sediments like silts and clays can be carried several thousand feet downstream of construction zones, while larger-sized sediments like coarse sands and gravels tend to drop out of the water column within several feet of the construction zone.

Low-flow channel crossings will be constructed of clean gravel-sized alluvial materials. Size criteria for alluvial materials that would be used in the construction of low-flow channel crossings are defined further in section 4.6. Placement of clean gravel-sized alluvial materials could temporarily increase turbidity and suspended materials during and immediately following construction of the crossing. Removal and distribution of alluvial materials upon connection of low-flow channels with the Trinity River could also increase turbidity and suspended materials during and immediately following excavation. In the event that additional material may be required to construct embankments and/or temporary bridge abutments upslope of the active channel, unprocessed native alluvial material will be used consistent with the requirements outlined in Chapter 2 design elements and construction criteria.

Collectively, the activities included in the Proposed Project could result in short-term increases in turbidity and suspended solids concentrations in the water column that could potentially violate the Basin Plan objectives for turbidity in the Trinity River. Short-term increases in turbidity and suspended solids levels during construction would be a significant impact.

Alternative 1

Temporary increases in turbidity or total suspended solids levels associated with construction of Alternative 1 would likely be lower than under the Proposed Project because of the reduction in in-channel and riverine activities.

Similar to the Proposed Project, rehabilitation activities would be staged to minimize potential turbidity effects. However, these activities could result in short-term increases in turbidity and suspended solids concentrations in the water column that could potentially violate the Basin Plan objectives for turbidity in the Trinity River. Short-term increases in turbidity and suspended solids levels during construction would be a significant impact.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

Turbidity increases associated with construction of the project could result in short-term, temporary increases in turbidity and total suspended solids levels during construction.

4.5-1a The water quality objective for turbidity levels in the Trinity River, as listed in the Basin Plan for the North Coast Region (North Coast Regional Water Quality Control Board 2007), is summarized below.

- Turbidity levels shall not be increased more than 20 percent above naturally occurring background levels. Allowable zones of dilution within which higher percentages can be tolerated may be defined for specific discharges upon the issuance of discharge permits or waiver thereof.

- Due to the nature of the proposed restoration activities and the clarity of the Trinity River during low flow conditions, the Regional Water Board has determined that an allowable zone of turbidity dilution is appropriate and necessary in order for Trinity River restoration activities to be accomplished in a meaningful, timely, and cost-effective manner that fully protects beneficial uses without resulting in a violation of the water quality objective for turbidity.

- Project activities that occur in areas outside of the active river channel will not increase turbidity levels by more than 20 percent above naturally occurring background levels. During in-river construction activities and until the first extended period of post-construction high flow (i.e., flows of at least 6,000 cfs inundate the project areas and floodplain for a minimum of 7 days) a zone of turbidity dilution within which higher percentages would be tolerated will be defined in discharge permits as the full width of the river channel within 500 linear feet downstream of any project activity that increases naturally occurring background levels, provided that all other required controls and appropriate BMPs for sediment and turbidity control are in place and downstream beneficial uses are also fully protected. When naturally occurring background levels are less than or equal to 20 NTUs, turbidity levels immediately downstream of the zone of turbidity dilution shall not exceed 20 NTUs. If naturally occurring background levels are greater than 20 NTUs, turbidity levels immediately downstream of the 500 linear foot zone of dilution shall not be increased by more than 20 percent above the naturally occurring background level.

4.5-1b To ensure that turbidity levels do not exceed the thresholds described above (4.5-1a) during in-river project construction activities, Reclamation shall monitor turbidity levels upstream within 50 feet of project activities (i.e., natural background) and 500 feet downstream of the in-river construction activities that could increase turbidity. At a minimum, field turbidity measurements shall be collected whenever a visible increase in turbidity is observed. Monitoring frequency shall be a minimum of every two hours during in-river work periods and when activities commence that are likely to increase turbidity levels above any previously monitored levels.

If grab sample results indicate that turbidity levels exceed 20 NTU at 500 feet downstream from construction activities, remedial actions will be implemented to reduce and maintain turbidity at or below 20 NTU immediately downstream of the 500 linear foot zone of dilution. Potential remedial actions include halting or slowing construction activities and implementation of additional BMPs until turbidity levels are at or below 20 NTU.

4.5-1c Fill gravels used on the streambeds, stream banks, and river crossings will be composed of washed, spawning-sized gravels from a local Trinity River basin source. Gravel will be washed to remove any silts, sand, clay, and organic matter and will be free of contaminants such as petroleum products. Washed gravel will pass Caltrans cleanliness test #227 with a value of 85 or greater.

4.5-1d Reclamation will prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) that describes BMPs for the project, including silt fences, sediment filters, and routine monitoring to verify effectiveness. Proper implementation of erosion and sediment controls will be adequate to minimize sediment inputs into the Trinity River until vegetation regrowth occurs. All required controls and BMPs, including sediment and erosion control devices, will be inspected daily during the construction period to ensure that the devices are properly functioning. Excavated and stored materials will be kept in upland activity areas with erosion control properly installed and maintained. Excavated and stored materials will be staged in stable upland activity areas. All applicable erosion control standards will be required during stockpiling of materials.

4.5-1e To minimize the potential for increases in turbidity and suspended sediments entering the Trinity River as a result of access routes (e.g., roads), Reclamation will implement the following protocols:

- Keep bare soil to the minimum required by designs. Erosion control devices/measures will be applied to areas where vegetation has been removed to reduce short-term erosion prior to the start of the rainy season.
- Keep runoff from bare soil areas well dispersed. Dispersing runoff keeps sediment on-site and prevents sediment delivery to streams. Direct any concentrated runoff from bare soil

areas into natural buffers of vegetation or areas with more gentle slopes where sediment can settle out.

- Disconnect and disperse flow paths, including roadside ditches, that might otherwise deliver fine sediment to stream channels.
- Decompact or rip floodplain areas so that surfaces are permeable and no surface water runoff occurs.

Significance after Mitigation

Less than significant

Impact 4.5-2: Construction of the project could result in short-term, temporary increases in turbidity and total suspended solids levels following construction. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, no short-term increases in turbidity or total suspended solids levels would occur following construction because the project would not be constructed. Therefore, there would be no impact.

Proposed Project

The riverine activities described in Chapter 2 emphasize in-channel excavation and placement of alluvial materials, selective removal of fossilized riparian berms reconnecting the river's floodplain with the river at intermediate flows (between 450 and 6,000 cfs), and enhancing or constructing side-channels that function under various flows. The character and location of alluvial features associated with the Trinity River were modified by the construction and operation of the TRD in response to changes in the flow and sediment regimes, particularly the loss of scouring associated with peak flows. Modification or reconstruction of these alluvial features at strategic locations will promote the river processes necessary for the restoration and maintenance of Trinity River alternate bars, thereby enhancing salmonid rearing habitat. These activities will also increase the habitat available for salmonid rearing under various flows.

Implementing the Proposed Project would increase turbidity and total suspended solids in the river and fluvial surfaces following construction. Following construction, increases in turbidity levels would occur when newly disturbed areas are exposed to elevated river stages during high river flows. Fine sediments may be suspended in the river for several hours following such exposure and erosion. The extent of downstream sedimentation would be a function of the rainfall intensity and/or instream flow velocity, as well as the particle size of exposed sediments. Lower intensity rainfalls would be unlikely to mobilize fine sediments because the precipitation would be absorbed. If fine sediments are mobilized by flow over newly disturbed areas, they could be carried several thousand feet downstream of the activity areas, while larger sized sediments, such as sands and gravels, would tend to drop out of the water column within several feet of the activity areas.

Post-construction exposure of sediments to rainfall and/or flows would result in short-term increases in turbidity and suspended solids concentrations in the water column that could potentially be in violation of the Basin Plan turbidity objective for the Trinity River. A short-term increase in turbidity and suspended solids levels following construction would be a significant impact.

Alternative 1

Under Alternative 1, the reduction of activities would decrease the surface area subject to erosional processes. Short-term increases in turbidity and suspended solids levels following construction would be a significant impact.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

4.5-2a Turbidity increases associated with project activities will not exceed the water quality objectives for turbidity in the Trinity River basin (North Coast Regional Water Quality Control Board 2007).

4.5-2b To ensure that turbidity levels do not exceed the threshold following construction, Reclamation will monitor turbidity and total suspended solids during and after representative rainfall events to determine the effect of the project on Trinity River water quality. At a minimum, field turbidity measurements will be collected whenever a visible increase in turbidity is observed.

- If increases in turbidity and total suspended solids are observed as a result of erosion from constructed features, field turbidity measurements will be collected 50 feet upstream of a point adjacent to the end of the feature and 500 feet downstream of the feature.

- If the grab sample indicates that turbidity levels exceed the established thresholds identified in the Basin Plan, the Regional Water Board will be notified. The need to implement erosion control measures for turbidity that is expected to result from overland river flows (versus surface run-off) will be evaluated with Regional Water Board staff to determine if remediation measures are needed.

4.5-2c To reduce the potential for the access routes to continually contribute soil materials to the Trinity River following project construction, thereby increasing turbidity and total suspended solids in the river, these routes will be stabilized or decommissioned upon completion of work in those areas consistent with the requirements outlined in Chapter 2 (Design Elements and Construction Criteria). Decommissioning is defined as removing those elements of a road that reroute hillslope drainage and present slope stability hazards.

Significance after Mitigation

Less than significant

Impact 4.5-3: Construction of the project could cause contamination of the Trinity River from hazardous materials spills. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, no construction-related contamination of the Trinity River from spills of hazardous materials would occur because the project would not be constructed. Therefore, there would be no impact.

Proposed Project and Alternative 1

Construction staging activities could result in a spill of hazardous materials (e.g., oil, grease, gasoline, and solvents) into the Trinity River. In addition, operation of construction equipment in or adjacent to the river would increase the risk of a spill of hazardous materials into the river (e.g., from leaking of fluids from construction equipment). Spills of hazardous materials into or adjacent to the Trinity River could degrade water quality and have deleterious effects on salmonids of any life stage that are in close proximity to construction activities. Section 4.13, Hazardous Materials, evaluates potential effects associated with exposing the public to hazards associated with the transportation and use of hazardous materials at the project sites. Additional requirements outlined in Chapter 2 (Design Elements and Construction Criteria) will be incorporated into the project description to reduce the potential impact. However, construction activities could result in a spill of hazardous material, which would be a significant impact.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

4.5-3a Reclamation will prepare and implement a spill prevention and containment plan in accordance with applicable federal and state requirements.

4.5-3b Reclamation will ensure that any construction equipment that would come in contact with the Trinity River be inspected daily for leaks prior to entering the flowing channel. External oil, grease, and mud will be removed from equipment using steam cleaning. Untreated wash and rinse water must be adequately treated prior to discharge if that is the desired disposal option.

4.5-3c Reclamation will ensure that hazardous materials, including fuels, oils, and solvents, not be stored or transferred within 150 feet of the active Trinity River channel. Areas for fuel storage, refueling, and servicing will be located at least 150 feet from the active river channel or within an adequate secondary fueling containment area. In addition, the construction contractor will be responsible for maintaining spill containment booms onsite at all times during construction operations and/or staging of equipment or fueling supplies. Fueling trucks will maintain a spill containment boom at all times.

Significance after Mitigation

Less than significant

Impact 4.5-4: Construction of the project could result in increased stormwater runoff and subsequent potential for erosion. *No impact for the No-Project Alternative; less-than-significant impact for the Proposed Project and Alternative 1.*

No-Project Alternative

Under the No-Project Alternative, there would be no increases in stormwater runoff and the potential for subsequent erosion because the project would not be constructed. Therefore, there would be no impact.

Proposed Project and Alternative 1

Implementation of the Proposed Project and Alternative 1, including those measures described in Chapter 2 (Design Elements and Construction Criteria), would not result in an increase in impervious surface areas (e.g., structures and roadway approaches) that could subsequently generate additional stormwater runoff and potential for erosion. Grading activities, including the use of rippers during grading activities, are expected to eliminate surface runoff during the first year after construction. Access routes under these alternatives would be located on gentle terrain and would require minimal grading. The impact associated with runoff and erosion would, therefore, be less than significant.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.5-5: Construction and maintenance of the project could result in the degradation of the beneficial uses of the Trinity River identified in the Basin Plan. *No impact for*

the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.

No-Project Alternative

Under the No-Project Alternative, no degradation of Trinity River beneficial uses would occur because the project would not be constructed. Therefore, there would be no impact.

Proposed Project and Alternative 1

Under either action alternative, significant impacts to beneficial uses of the Trinity River could occur in the following categories of water quality objectives listed in the Basin Plan:

- sediment
- toxicity
- turbidity
- settleable material
- suspended material
- chemical constituents

The magnitude of these impacts would be lower for Alternative 1 than for the Proposed Project, primarily due to the reduction in the location and number of these activities. Although the design elements and construction methods described in Chapter 2 are intended to minimize these impacts, under either action alternative, the activities associated with the placement and deconstruction of the low-flow channel crossings combined with the construction of new road access to the activity areas would result in significant impacts.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required

Proposed Project and Alternative 1

The significance of impacts related to sediment, settleable materials, suspended materials, turbidity, and increased stormwater runoff and subsequent potential for erosion, as well as mitigation measures that would reduce the significance of these impacts, are addressed under Impacts 4.5-1, 4.5-2, and 4.5-4. The significance of, and mitigation for, chemical constituents and toxicity impacts are addressed under Impact 4.5-3.

Significance after Mitigation

Less than significant

SECTION 4.6

Fishery Resources

4.6 Fishery Resources

This section describes the fisheries resources in the Trinity River basin in proximity to the proposed Remaining Phase 1 and Phase 2 rehabilitation sites along the Trinity River, emphasizing native anadromous and resident fish and non-native fish. It also evaluates potential impacts to fisheries resources from implementation of the Proposed Project.

The Trinity River Flow Evaluation Study (U.S. Fish and Wildlife Service and Hoopa Valley Tribe 1999) determined that the lack of spawning and rearing habitat for juvenile salmonids is likely a primary factor in limiting the recovery of salmonid populations in the Trinity River. The Proposed Project is specifically designed to increase the abundance of habitat for Trinity River salmonids by reconnecting the river with its floodplain, and increasing channel sinuosity.

4.6.1 Environmental Setting

Native Anadromous Fish Species

The native anadromous salmonid species of interest in the mainstem Trinity River and its tributaries are Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*Oncorhynchus kisutch*), and steelhead (*Oncorhynchus mykiss irideus)*. There are two spawning races of Chinook salmon (spring- and fall-run) and two spawning races of steelhead (winter- and summer-run). The life histories and fresh water habitat requirements of these species and their distinct spawning populations are described in Appendix G.

All anadromous salmonid species begin their life in fresh water, migrate to the ocean to rear and mature, and return to spawn in fresh water. Although the three species have generally similar life histories, they differ in the time of year they migrate and spawn, as well as when egg incubation typically occurs (Figure 4.6-1).

Adequate flows, water temperatures, water depths, and velocities; appropriate spawning and rearing substrates (e.g., riverbed gravels); and availability of instream cover and food are critical for the production of all anadromous salmonids. Spring-run Chinook salmon and summer-run steelhead also need long-term adult holding habitat for which pool size and depth, temperature, cover, and proximity to spawning gravel are important requirements. Newly emerged fry and juveniles of all species require rearing habitat with low velocities, open cobble substrate, and cool water temperatures. The emigration of smolts to the ocean and the immigration of spawning adults require adequately timed flows with the appropriate temperature, depth, and velocity.

Native non-salmonid anadromous species that inhabit the Trinity River basin include green sturgeon (*Acipenser medirostris*) and Pacific lamprey (*Lampetra tridentata*). These fish spend their early life stages in fresh water, migrate to the ocean for maturation, and return to their natal streams to spawn. Appendix G provides additional information on these species and their life stages. Information on native non-salmonid anadromous species residing in the Trinity River basin is very limited. However, the Klamath/Trinity River basin is known to contain the largest spawning population of green sturgeon in California (Moyle 2002).

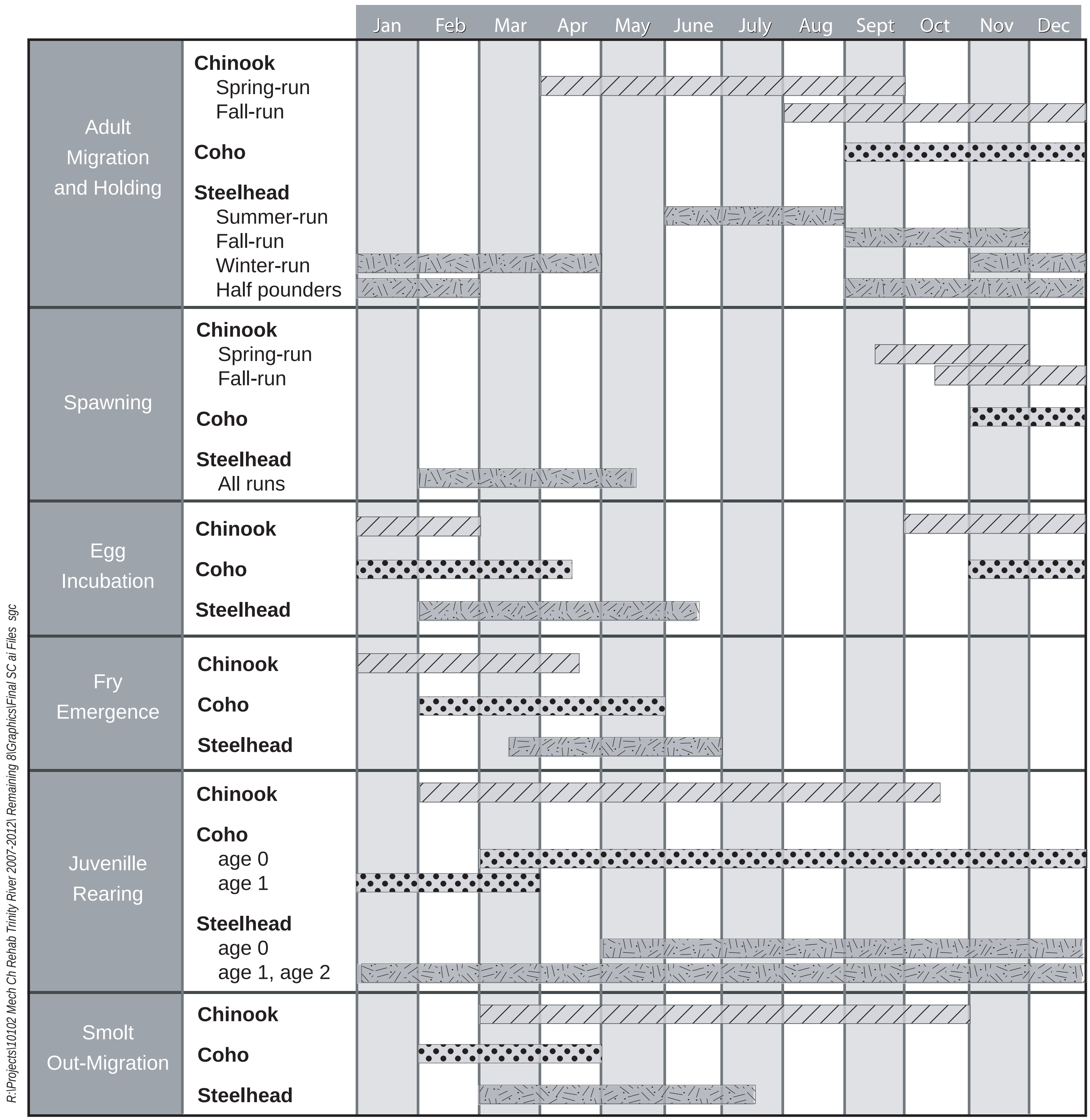


Figure 4.6-1
Trinity River Anadromous Salmonid
Life History Patterns

All three species of native anadromous salmonids may be expected to occur throughout the mainstem Trinity River below Lewiston Dam, including the segments associated with the Remaining Phase 1 and Phase 2 sites. All freshwater life stages of these species (i.e., adult, embryo, fry, and juvenile/smolt) may be expected to use habitats in this reach. The anadromous Pacific lamprey may also be expected to occur in each of its freshwater life stages (i.e., adult, embryo, larval ammocoete, metamorphosed and emigrating juvenile) within this reach of the Trinity River.

Adult spring-run Chinook salmon use the mainstem Trinity River for holding and spawning habitat. Adult spring-run Chinook are likely to hold in the deeper pool habitats, especially from late April through August. These fish commence spawning about the second week of September and spawn through mid-October. Fry and juvenile spring-run Chinook salmon would be expected from late December through October in suitable habitats throughout the proposed rehabilitation sites. Outmigration of spring-run smolts would occur from late October through June.

Adult fall-run Chinook salmon migrate to, and are expected to use, suitable spawning habitat within and adjacent to the Remaining Phase 1 and Phase 2 sites, typically from late September through mid-December. Fry and juveniles are expected in suitable rearing habitats from January through June (Manji, pers. comm. 2004). Sub-yearling fall Chinook smolts generally outmigrate from April through June (Leidy and Leidy 1984; Moyle 2002).

Trinity River coho salmon populations were historically smaller than Chinook salmon populations. Pre-dam estimates for coho salmon spawning above Lewiston were 5,000 fish (U.S. Fish and Wildlife Service et al. 2000a). Access to high-quality habitat with year-round cold, clear flows for coho salmon was blocked by construction of the TRD (U.S. Fish and Wildlife Service and Hoopa Valley Tribe 1999). Because coho salmon generally rear for at least one full year in freshwater, prior to TRD construction, seasonally warm water temperatures occurring in much of the mainstem Trinity River during the summer limited mainstem coho production in downstream reaches (Moffett and Smith 1950).

Adult summer-run steelhead hold primarily in the headwaters of mainstem Trinity tributaries during the summer months and spawn during the following late winter/early spring. Some Trinity River steelhead return to the river 4 to 6 months after first emigrating to the ocean. Upon their return, these fish, known as “half-pounders,” feed in the river but do not spawn. They subsequently return to the ocean before returning to spawn. When in the half-pounder phase, these fish are not counted as part of the escapement (i.e., number of fish returning to spawning grounds), but they are important to the sport fishery.

Trinity River Restoration Program Goals

The 1983 EIS for the Trinity River Basin Fish and Wildlife Management Program (U.S. Fish and Wildlife Service 1983) documented historical in-river and hatchery spawner escapements. Based on this level of escapement, goals were developed to compensate for the impacts to the fishery resources resultant from the construction and operation of the TRD. The Trinity River Salmon and Steelhead Hatchery (TRSSH), managed by the CDFG, is charged with implementation of the hatchery production goals to meet the hatchery escapement objectives. These spawner escapement goals were subsequently adopted by the

TRRP. The in-river goals represent the total number of naturally produced adult spawners (excluding jacks[1]) for the Trinity River basin below Lewiston Dam and exclude fish caught (Table 4.6-1). The hatchery goals represent numbers of adult fish needed by the hatchery, exclusive of fisheries for Chinook and coho salmon. An undefined in-river harvest goal for steelhead is also established by the TRRP.

Table 4.6-1. Trinity River Restoration Program Spawner Escapement Goals

Species	In-River Spawner Goals	Hatchery Goals	Total
Fall-run Chinook	62,000	9,000	71,000
Spring-run Chinook	6,000	3,000	9,000
Coho	1,400	2,100	3,500
Steelhead	40,000	10,000	50,000

Source: U.S. Fish and Wildlife Service et al. 2000b

In-river spawner escapement is the number of fish returning to spawning grounds, which consists of two subgroups, naturally produced fish and hatchery-produced fish. Marking of hatchery-produced fish, which began in the mid 1980s, allows for estimation of the hatchery-produced component of each run annually, allowing for independent estimates of hatchery-produced and naturally-produced fish. Though hatchery-produced fish are not considered to contribute toward natural in-river spawner escapement goals of the TRRP, their offspring do (i.e., if hatchery-produced fish spawn in-river and their offspring survive to return to spawn, these offspring never are marked and are naturally produced by definition). The best available data indicate that large numbers of hatchery-produced fish spawn in-river, particularly in areas close to the hatchery.

Fall-Run Chinook Salmon Population

Average in-river escapement of naturally produced fish (Table 4.6-2) was calculated by averaging annual in-river spawner escapement above Willow Creek weir (with the exception of spring-run Chinook salmon that were estimated above Junction City weir) for the years of available data (excluding grilse[2]) multiplied by the percentage of that population estimated to be “natural spawners” reported in the Trinity River Mainstem Fishery Restoration EIS/EIR (U.S. Fish and Wildlife Service et al. 2000b).

Although annual pre-dam escapement data are sporadic, estimates of the number of fall-run Chinook salmon adults in the Trinity River prior to 1964 above the North Fork ranged from 19,000 to 75,600 and averaged 45,600 for the 5 years of available data. Comparisons between pre- and post-dam averages are difficult because (1) few pre-dam estimates exist; (2) pre-dam estimates typically represent fish spawning in the river above the North Fork, while post-dam estimates are above Willow Creek; and (3) post-dam estimates are only for the river below Lewiston Dam and are confounded by large numbers of hatchery-produced fish that spawn in natural areas (recent changes have been enacted to reduce competition of

[1] A male salmon that spawns after spending a year or two less in the sea than the majority of individuals of its species. It is smaller than the usual spawner.
[2] A mature one-winter salmon ready to spawn

hatchery-produced fish with naturally produced spawners). Comparisons between pre-dam escapements and the TRRP in-river spawner escapement goals are not equitable because the in-river goals represent the numbers of fish that could be produced in the entire Trinity River basin below Lewiston Dam once successful restoration is completed, whereas the pre-dam numbers are sporadic and limited to the Trinity River above the North Fork.

Table 4.6-2. Comparison of TRRP In-River Spawner Escapement Goals to Average Numbers of Naturally Produced Fish

Species	TRRP In-River Spawner Escapement Goals	Average In-River Escapement of Naturally Produced Fish	Years of Available Data	Percent of TRRP Goal Met
Fall-run Chinook	62,000	11,940	1982–2007	19
Spring-run Chinook	6,000	4,024	1982–2005	67
Coho	1,400	306	1982-2005	22
Steelhead	40,000	3,010	1992–1996/ 2002–2005	8

Source: Sinnen et al. 2008, U.S. Fish and Wildlife Service et al. 2000b, and California Department of Fish and Game, unpublished data

Yearly estimates of fall-run Chinook salmon runs in the Trinity River basin have been compiled by CDFG since 1978 as a part of the Klamath Basin Fall Chinook Salmon Spawning Escapement Estimate. Post-dam in-river spawner escapement estimates for the Trinity River basin upstream of Willow Creek weir from 1982 through 1997 averaged 34,670 fall-run Chinook salmon, of which an average of 22,440 fish are hatchery-produced fish. Naturally produced fish have ranged from 10 to 94 percent of in-river spawner escapements, with an average of 47 percent. Applying this proportion to escapement surveys from 1982 through 2007, the Trinity River below Lewiston produced an average of 11,940 naturally produced fall-run Chinook spawners, which is approximately 19 percent of the TRRP goal of 62,000 naturally produced fall-run Chinook salmon (Table 4.6-2).

In September 2002, a large fish die-off occurred in the Klamath River. A conservative estimate of the total number of fish that died during the incident is 34,056, of which approximately 98.4 percent were adult anadromous salmonids. Out of the 33,527 anadromous salmonids estimated to have succumbed during this event, 97.1 percent were fall-run Chinook salmon. The Klamath River Technical Advisory Team estimated that 21.7 percent of the Chinook were of hatchery origin, with 12.7 percent being of Trinity River Hatchery origin (U.S. Fish and Wildlife Service 2003). The fish die-off disproportionately affected fall-run Chinook salmon, resulting in subsequent reduced production (Sinnen et al. 2005).

Spring-Run Chinook Salmon Populations

Fisheries investigations conducted from 1942 through 1946 identified spring-run Chinook salmon populations in the Trinity River above the North Fork Trinity River confluence (Moffett and Smith 1950). In 1955, an in-river spawner escapement estimate of 3,000 spring-run Chinook salmon upstream of

Lewiston was reported by the CDFG (U.S. Fish and Wildlife Service et al. 2000b). Escapement surveys for the years 1982 through 2000 (excluding 1983 and 1995 because surveys were not conducted in those years) indicate that an average of 65 percent of the in-river spawner escapement of Trinity River spring-run Chinook salmon was hatchery produced (Figure 4.6-2). Conversely, only 35 percent were naturally produced. For the years 1982 through 2005 (excluding 1983 and 1995 as noted above), the Trinity River below Lewiston Dam produced an average of 4,024 spring-run Chinook salmon or 67 percent of the TRRP goal (Table 4.6-2).

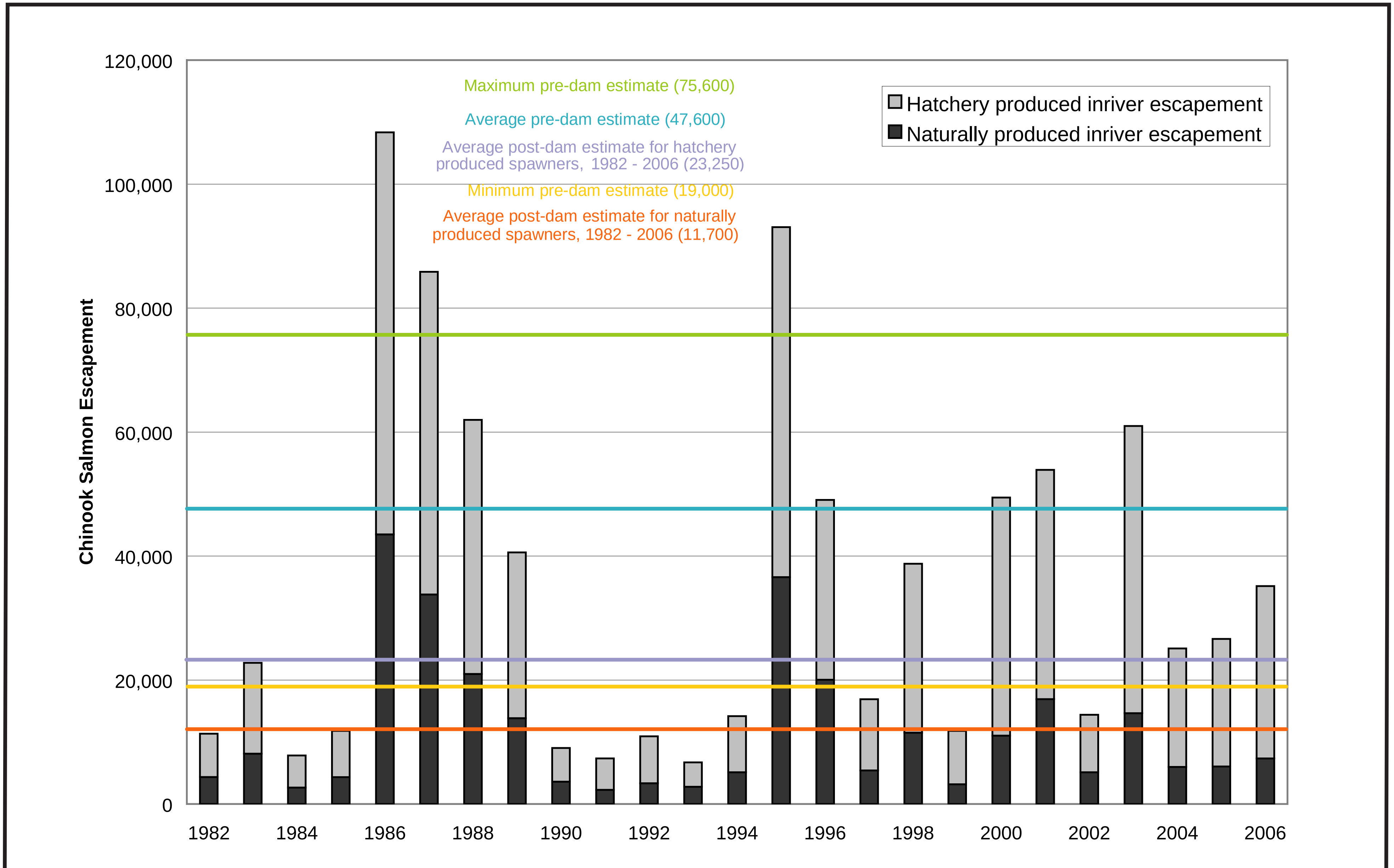
Coho Salmon Populations

As described previously, Trinity River coho salmon populations were historically smaller than Chinook salmon populations. Seasonally, warm water temperatures typical of the Trinity River prior to the construction of the TRD limited mainstem coho production in downstream reaches (Moffett and Smith 1950). Total run size for Trinity River coho salmon below Lewiston Dam from 1973 through 1980 averaged 3,300 adults (U.S. Fish and Wildlife Service et al. 2000b). This estimate includes hatchery production. Estimates of coho salmon spawning in the Trinity River upstream of the Willow Creek weir (1991–1995) indicated that naturally produced coho salmon averaged 200 fish, ranging from 0 to 14 percent of the total annual escapement (an annual average of 3 percent). Current estimates for coho salmon spawning in the Trinity River upstream of the Willow Creek weir (1982–2005) indicate that naturally produced coho salmon average about 306 fish, which is approximately 22 percent of the TRRP goal of 1,400 (Table 4.6-2).

The majority of coho salmon spawning in the Trinity River are produced by the hatchery. Based on the levels of in-river naturally-produced coho salmon, NMFS has concluded that (1) current coho salmon runs are largely composed of hatchery-produced adults; (2) the remaining naturally produced stocks are, and have been, heavily influenced by hatcheries (such as from occasional inter-basin stock transfers); and virtually all of the naturally spawning coho salmon, in the Trinity River particularly, are first-generation hatchery fish; and (3) the remaining natural coho salmon populations in the Klamath/Trinity River system are likely incapable of sustaining themselves (National Marine Fisheries Service 1997).

Between 1997 and 2002, hatchery fish constituted an estimated 89 percent to 97 percent of the fish (adults plus reproductively mature grilse) returning to the Willow Creek weir in the lower Trinity River (Sinnen 2002). Outmigrant trapping conducted on the lower Trinity River indicates that marked TRSSH fish made up 91 percent, 97 percent, and 65 percent of the catch in years 1998, 1999, and 2000, respectively (Yurok Tribal Fisheries Program 2002). Additionally, it appears that a significant fraction of the naturally produced fish is likely the progeny of hatchery strays.

By subtracting the number of hatchery- and naturally produced fish returning to TRSSH from counts at Willow Creek weir, Sinnen (2002) estimated that hatchery fish made up between 76 percent and 96 percent of fish that spawned in the Trinity River system upstream of the weir from 1997 to 2002. The lack of natural production in the Trinity Basin, however, remains a significant concern (Good et al. 2005).



(Source: USFWS et al. 2001; CDFG unpublished data)

Figure 4.6-2
Post-TRD Fall-run Chinook Salmon Spawner Escapements

NMFS' updated status review of federally listed west coast salmon and steelhead concluded that none of the new data reviewed contradict conclusions that the Biological Review Team previously reached in 1995 and 1997. Coho salmon populations continued to be depressed relative to historical numbers, and strong indications exist that breeding groups have been lost from a significant percentage of streams in their historical range (Good et al. 2005).

Since 2000, however, run size estimates for coho salmon in the Trinity River have increased in comparison to the depressed estimates through the 1990s. In 2004, run size estimates for Trinity River coho salmon upstream of Willow Creek weir were 1.2 times the long-term (1977–2004) average of 17,778 (Sinnen et al. 2006). Additionally, average run-size estimates for Trinity River coho salmon between 2000 and 2004 are more than double what they were for the previous 10-year period. Recent increases in coho salmon populations can be attributed to a number of factors, including, but not limited to, favorable ocean conditions, elimination of the sport and commercial coho fishery, recent water years with average to above average rainfall and relatively high river flows, and recent habitat improvements and protection.

Coho salmon were also affected by the Klamath fish die-off in 2002, but not nearly to the extent of Chinook salmon. One percent of the adult anadromous salmonids that died were coho salmon. Of that one percent, approximately 92 percent were of TRSSH origin (U.S. Fish and Wildlife Service 2003).

Steelhead

As stated previously, adult summer-run steelhead hold primarily in the headwaters of mainstem Trinity tributaries during the summer months and spawn during the following late winter/early spring. Pre-dam winter-run steelhead spawner escapements in the Trinity River and its tributaries upstream of Lewiston have been estimated to range from 6,900 to 24,000 adults. From 1992 through 1996, and again for years 2002 and 2005, the CDFG estimated run sizes for wild and hatchery-produced steelhead upstream of Willow Creek weir. The estimated total steelhead escapement of the naturally produced fall/early-winter portion of the winter run upstream of the Willow Creek weir averaged 3,010 fish (surveys from fall and early winter period only). This average represents approximately 8 percent of the TRRP in-river spawner escapement goal of 40,000 adult steelhead (Table 4.6-2). Estimates for the remaining winter portion of the escapement are unavailable because winter river flows render fish-counting weirs inoperable.

Pre-dam summer-run steelhead spawner escapements for the Trinity River upstream of Lewiston were estimated to average 8,000 adults annually. Recent (1985–2002) post-dam CDFG/USFS estimates have ranged from 20 to 2,575 adult summer-run steelhead returning to the mainstem Trinity River and tributaries (California Department of Fish and Game 1997, unpublished data; U.S. Forest Service 2002, unpublished data). The TRRP escapement goals do not establish specific targets for summer-run steelhead in the Trinity River, nor does the TRSSH mitigate specifically for summer-run steelhead.

Trinity River Salmon and Steelhead Hatchery

The TRSSH is operated by CDFG and funded by Reclamation to mitigate for the loss of salmonid production upstream of Lewiston Dam resulting from the TRD. Concerns regarding the potential impacts of hatchery operations on naturally produced populations of the Klamath River basin (including the Trinity River) prompted the CDFG to revise hatchery operations in 1996 to minimize future impacts. Additionally, further review of hatchery operations conducted during 1999 and 2000 resulted in recommendations for (1) periodic evaluation of coho salmon production levels required to support recovery of Southern Oregon/Northern California Coast Evolutionarily Significant Unit (SONCC ESU) coho salmon and (2) evaluation of spawning and brood stock selection practices for maintaining genetic separation of spring- and fall-run Chinook salmon (California Department of Fish and Game and National Marine Fisheries Service 2001).

Fish Harvest

The harvest of Klamath River basin (including the Trinity River basin) fall-run Chinook salmon is managed jointly by the CDFG, Oregon Department of Fish and Wildlife, California Fish and Game Commission, YT, HVT, NMFS, and U.S. Bureau of Indian Affairs (BIA). The mixed-stock ocean population is harvested by commercial and sport fisheries and the in-river population is harvested by tribal (ceremonial, subsistence, and commercial) and sport fisheries. Chinook salmon harvest (both fall-run and spring-run) includes both naturally produced and hatchery-produced fish. Commercial and sport harvest of coho salmon has been incrementally restricted in California ocean and inland waters since 1994, resulting in statewide harvest prohibitions within the last 5 years, including the use of barbless hooks and “catch and release only.” The steelhead is rarely caught in the ocean commercial and sport fisheries, but is harvested by the in-river tribal and sport fisheries. Historically, Klamath/Trinity River Chinook and coho salmon populations have been harvested in the ocean from Santa Barbara County, California, to the Oregon/Washington border. Ocean harvest of naturally produced salmon may have been sufficient in the late 1970s to cause declines in Klamath River basin (including Trinity River) populations, but, based on the best available data, fall-run Chinook salmon harvest management restrictions implemented since 1986 have decreased harvest impacts to levels believed to be sustainable.

Habitat Conditions

Construction and operation of the TRD, combined with watershed erosion, large-scale gold dredging, and other human-caused disturbances, have resulted in major changes in habitat conditions in the Trinity River. Factors that have resulted in adverse effects on fish habitat include

- obstruction to river reaches upstream of the TRD (Lewiston Dam),
- changes to quantity and timing of flows,
- changes in channel geomorphology,
- changes in substrate composition caused by the addition of fine sediments and restriction of gravel recruitment, and
- changes in water temperature.

These factors are addressed in other sections of this document, specifically section 4.3, Geology, Fluvial Geomorphology, and Soils; section 4.4, Water Resources; and section 4.5, Water Quality. The relationship between these factors and fish is summarized in the following paragraphs.

The TRD dams blocked access to 59 miles of Chinook salmon habitat, 109 miles of steelhead habitat, and an undetermined amount of coho salmon habitat (U.S. Fish and Wildlife Service 1994). Much of this habitat is thought to have been prime spawning and rearing habitat. In the case of Chinook salmon, it represented about 50 percent of the suitable spawning habitat in the upper Trinity River basin. As early as 1980, the overall decline in spawning habitat was estimated at 80 to 90 percent (U.S. Fish and Wildlife Service 1980). Furthermore, the blocking of salmon access to upstream reaches greatly reduced the diversity of habitats available to salmon in the Trinity River.

For the first 21 years of TRD operations (1964 to 1985), Lewiston Dam releases to the Trinity River averaged only 21 percent of the natural river inflow. The reduction in flows led to a reduction in habitat and declining quality in the remaining habitat. For example, spawning habitat losses in the mainstem Trinity River below the Grass Valley Creek confluence have been estimated to be 80 percent in the first 2 miles and up to 50 percent overall in the 6 miles downstream of that confluence (U.S. Fish and Wildlife Service 1994).

The altered patterns of fluvial geomorphic processes in the upper Trinity River have resulted in a reduction in the number of alternate gravel bar sequences with a resultant change in substrate quality. Important salmonid habitats associated with alternate bars include pools that provide cover from predators and cool resting places for juveniles and adults; riffles with appropriate sized gravel substrate where adults typically spawn; open gravel/cobble bars that create shallow, low-velocity zones important for emerging fry; and slack-water habitats for rearing juveniles. Additionally, functional side-channel habitat has also been affected by modifications to alluvial deposits.

Changes in substrate composition occur in conjunction with upland and riverine processes. The construction and operation of the TRD have modified the sediment regime of the mainstem Trinity River, particularly the 40-mile reach below Lewiston Dam. Fine sediment fills open spaces between gravels and cobbles, which impedes water percolation through the river substrates, degrading and reducing available spawning habitats. Sedimentation of spawning areas can impede intragravel flow (which is important for delivering oxygen and carrying away metabolic waste products) to incubating embryos, as well as create an impenetrable barrier that prevents the emergence of salmon sac-fry from their gravel nest. Accumulation of fine sediments can also decrease the amount of space between gravel and cobble, thereby decreasing the amount of available habitat for over wintering juvenile coho salmon and steelhead that “burrow” into the substrate. Sedimentation may also decrease aquatic invertebrate production and diversity, thereby limiting a primary food source for juvenile salmonids.

The thermal environment of the Trinity River has also changed as a combined result of the construction and operation of the TRD and the subsequently altered geomorphic patterns of the river downstream. In comparison to pre-TRD conditions, water temperatures below Lewiston Dam today are cooler in the summer and warmer in the winter.

The dams blocked access to the upstream river reaches that are dominated by snowmelt runoff and remain cool throughout the year. Prior to the dam, these areas provided important juvenile rearing and adult holding habitats for salmonids when the majority of the lower mainstem habitats (i.e., below Lewiston

Dam) had likely become too warm. The upstream tributaries contributed snowmelt runoff and cool temperatures throughout the spring and early summer that aided smolt emigration through much of the mainstem. Because the habitat in the upper river is now blocked by the TRD and much of the snowmelt is retained in the TRD reservoirs, it is necessary to maintain artificially cooler temperatures below Lewiston Dam than existed prior to the TRD. The Trinity River below the dam must now function thermally like the upstream reaches and tributaries for anadromous salmonids.

Habitat Restoration Projects

Since the early 1980s, the Trinity River Basin Fish and Wildlife Restoration Program has conducted a variety of restoration activities in the mainstem Trinity River and its tributaries. These activities include watershed rehabilitation and habitat enhancement work within the tributaries, and dam construction and channel dredging in Grass Valley Creek to decrease the amount of fine sediment entering the mainstem Trinity River. Restoration activities in the mainstem Trinity River have included coarse sediment (spawning gravel) supplementation, pool dredging to remove fine sediment and restore valuable holding habitat and construction of several channel rehabilitation projects (side channels and bank rehabilitation of point bars). In late fall 2005, the TRRP completed the Hocker Flat demonstration project, which was the first mechanical channel rehabilitation project stemming from the TRRP ROD. Construction on the Canyon Creek project was completed in 2006, and the Indian Creek project was completed in 2007. Construction of the Lewiston-Dark Gulch project was finished in December of 2008.

Completion of the Trinity and Lewiston dams in 1964 blocked migratory fish access to aquatic habitat upstream of Lewiston Dam and eliminated coarse sediment transport from more than 700 square miles of the upper watershed. The lack of coarse sediment transport reduced the quantity and quality of gravel-sized material available for salmonid spawning and rearing in the mainstem Trinity River. The Preferred Alternative in the 2000 ROD for the Trinity River Mainstem Fishery Restoration EIS included a sediment management component that called for gravel supplementation in the Trinity River. The FEIS identified two sites that would require immediate coarse sediment augmentation for spawning purposes. The ROD anticipated an average of 10,300 cubic yards annually but acknowledged a range from 0 to 67,000 cubic yards in any one year depending upon the water year type The two sites include a 1,500-foot reach immediately downstream of Lewiston Dam and a 750-foot reach immediately upstream of the USGS cableway at Lewiston (U.S. Fish and Wildlife Service et al. 1999). In 2003, 3,000 tons of ½- to 5-inch diameter gravel was placed at the cableway. In 2006, 2,500 tons of ½- to 5-inch diameter gravel was placed downstream of the TRSSH as part of the Shasta Trinity National Forest (STNF) Hatchery Coarse Sediment Project. The purpose of these projects was to supplement coarse sediment in the reach immediately downstream of Lewiston Dam. The 2006 work also included channel manipulations to about 1,800 linear feet of the mainstem Trinity River, beginning 400 feet downstream of Lewiston Dam, in accordance with the design concepts developed by the University of California, Davis, and approved by the TMC.

During 2007, an additional 6,500 tons of 3/8- to 4-inch diameter gravel were added downstream of the Lewiston Dam to complete the 2006 STNF Hatchery Coarse Sediment Project. In 2008, another 3,500 tons of gravel was introduced in the Lewiston reach during 2007 spring flows and 13,100 tons were placed in-channel (August and September 15 , 2008) during 2008 Lewiston-Dark Gulch project implementation.

From 1990 through 1993, the Trinity River Basin Fish and Wildlife Restoration Program constructed 29 channel rehabilitation projects on the mainstem Trinity River between Lewiston Dam and the North Fork Trinity River, 20 side-channel projects, and nine bank rehabilitation projects (also known as feathered-edge projects). Monitoring of the previous channel rehabilitation projects has documented Chinook salmon spawning within the constructed side-channels and along some "feathered-edge" sites (Chamberlain, pers. comm. 2004); U.S. Fish and Wildlife Service unpublished data). The nine bank rehabilitation projects between Lewiston Dam and the North Fork were constructed by physically removing vegetated sand berms along the bank to restore the channel to a "pre-dam configuration." Channel rehabilitation sites are significantly wider and shallower than corresponding control sites at intermediate and high flows. An evaluation of the monitoring results associated with early restoration efforts concluded that "when properly constructed, bank rehabilitation can effectively increase the amount of salmonid fry rearing habitat in the Trinity River" (U.S. Fish and Wildlife Service and Hoopa Valley Tribe 1999).

Resident Native and Non-Native Fish Species

Resident native fish species found in the Trinity River basin include game fish such as rainbow trout (*Oncorhynchus mykiss*) and non-game fish such as speckled dace (*Rhinichthys osculus*), Klamath smallscale sucker (*Catostomus rimiculus*), Klamath River lamprey (*Lampetra similis*), three-spined stickleback (*Gasterosteus aculeatus*), coast range sculpin (*Cottus aleuticus*), and marbled sculpin (*Cottus klamathensis*). The abundance of resident native species and the factors affecting their abundance within the basin are not well understood; however, all these species evolved and existed in the Trinity River prior to the TRD and are presumably adapted to those conditions.

Non-native fish species found in the Trinity and Klamath River basins include American shad (*Alosa sapidissima*), brown bullhead (*Ameiurus nebulosus*), green sunfish (*Lepomis cyanellus*), brown trout (*Salmo trutta*), and brook trout (*Salvelinus fontinalis*) (United States Fish and Wildlife Service, unpublished data). American shad are known to occur in the lowermost portions of the Trinity River basin, but are primarily found in the lower Klamath River basin. Anadromous brown trout were propagated in the TRSSH until 1977, when this practice was discontinued because of small numbers and the lack of anadromous characteristics of fish entering the hatchery. Currently, brown trout are largely limited to the upper portions of the river, although some brown trout exhibit anadromous characteristics. Brown trout are predatory in nature and as a result, bag limits in the Trinity River have recently been increased by CDFG to control their population. Brook trout provide a significant sport fishery in the tributary streams and high-elevation lakes of the Trinity River basin. Its life cycle and habitat requirements are similar to those of brown trout.

The structure and abundance of populations of these species in the Trinity and lower Klamath River basins are unknown. Factors that affect their abundance in the Trinity and lower Klamath River basins have not been studied and remain unknown.

Special-Status Fish Species

For the purposes of this evaluation, special-status fish species include species that are (1) listed as threatened or endangered by the state or federal governments under the ESA or CESA; (2) proposed or petitioned for federal listing as threatened or endangered; (3) state or federal candidates for listing as threatened or endangered; or (4) identified by CDFG as species of special concern and/or California Fully Protected Species. A list of special-status fish species to be considered for analysis was compiled by performing a search of the California Natural Diversity Database (CNDDB); informal consultations with the CDFG, USFWS, and NMFS; and a review of applicable biological literature.

The SONCC ESU of coho salmon was listed as threatened pursuant to the federal ESA on April 25, 1997. This listing includes coho salmon from the Trinity River and Klamath River basins. A review of the listing status of the SONCC ESU coho salmon was initiated during 2002 in response to a petition to de-list the species in the Klamath River basin (67 Federal Register 40679-40680). This status review included evaluation of both natural and hatchery components of the ESU according to the recently proposed policy on the consideration of hatchery-origin fish in federal ESA listing determinations for Pacific salmon and steelhead (69 Federal Register 31354-31359). NMFS recently concluded and that the SONCC ESU coho salmon should remain listed under the ESA as a threatened species (69 Federal Register 33102-33179).

Critical habitat for the SONCC ESU coho salmon was designated on May 5, 1999 and includes all river reaches accessible to the listed coho salmon between Cape Blanco and Punta Gorda. Excluded are areas above specific dams or above longstanding, naturally impassable barriers (e.g., natural waterfalls in existence for at least several hundred years). In the Trinity River basin, designated critical habitat for the SONCC ESU coho salmon consists of the water, substrate, and adjacent riparian zone of those estuarine and riverine reaches (including off-channel habitats and accessible tributaries) downstream of Lewiston Dam (CFR Vol. 64, No. 86, May 5, 1999).

The 2000 Biological Opinion on the Trinity River Mainstem Fishery Restoration EIS (National Marine Fisheries Service 2000) found that the program *"is not likely to jeopardize the continued existence of the [SONCC ESU] coho salmon"*, and *"is not likely to destroy or adversely modify critical habitat for the [SONCC ESU] coho salmon."*

This Biological Opinion included an incidental take statement authorizing the alternative actions described in this Master EIR, which envisioned some potential "take" of the listed coho salmon related to the channel rehabilitation component of the TRRP. The Biological Opinion states:

> "The NMFS does anticipate that SONCC coho salmon habitat adjacent to and downstream of the 47 channel rehabilitation projects may be temporarily degraded due to localized turbidity and potential fine sedimentation of channel substrate during construction activities. However, the amount of habitat temporarily degraded due to these localized effects is negligible compared to the long-term creation of additional suitable habitat along approximately 40 miles of the Trinity River."

The 2000 Biological Opinion includes several terms and conditions discussed in Chapter 3 of this document that serve to avoid and minimize "take" of the listed species during implementation of channel rehabilitation projects.

Both Reclamation's 2000 Biological Assessment and NMFS' subsequent 2000 Biological Opinion acknowledged that construction at channel rehabilitation projects would not occur "within the wetted channel." However, in-channel work would occur during direct placement of gravel for coarse sediment additions. After considerable restoration planning and design work by TRRP staff, NMFS, with support from the TMC, now considers in-channel work a necessary component to successfully carry out and achieve program goals and objectives as detailed in the ROD. Authorization to perform in-channel activities, as well as crossing the Trinity River for access to work sites, would create conditions conducive for sediment (gravel) routing as well as needed construction flexibility to maximize long-term benefits for Trinity River salmonid populations.

The TRRP concluded that reinitiation of formal consultation under Section 7 of the ESA was not warranted because effects to SONCC coho salmon were consistent with and not likely to rise above those that were considered in the original 2000 Biological Opinion. In May 2006, NMFS concurred that reinitiation of formal consultation was not warranted if bank rehabilitation activities were authorized within the wetted channel (National Marine Fisheries Service 2006). The Amendment to the 2000 Biological Opinion states:

> "Coho salmon primarily utilize tributary habitat for spawning and rearing and therefore, large numbers of coho salmon are not expected to be rearing within the mainstem Trinity River during the summer and fall period. Any increase in turbidity level arising from instream construction activities will likely affect the small population of juvenile coho salmon via the same mechanism as previously considered, that is, forcing fish to move downstream to escape turbid conditions. How the effect differs under the new regime is that more fish will relocate a farther distance downstream than originally considered due to the greater spatial extent of turbid water. However, NMFS expects that all displaced juvenile fish, including coho salmon, will find suitable habitat within river reaches downstream of the project, since juvenile rearing habitat within the Trinity River mainstem is likely under-saturated during summer and fall months. For these reasons, NMFS believes the proposed change to allow instream construction activities at future Trinity River Bank Rehabilitation sites is unlikely to cause additional effects to listed coho salmon above those that were considered within the original 2000 Biological Opinion."

To date, NMFS has determined that TRRP activities are consistent with the Biological Opinion (as amended), however as additional information becomes available through ongoing monitoring efforts, the TRRP anticipates that reinitiation of consultation between Reclamation and NMFS may be necessary to increase the TRRP's cost effectiveness and flexibility for implementation. Until restoration strategies and potential impacts to coho are evaluated, new options to increase river restoration effectiveness determined, and a new Biological Opinion written, the 2000 Biological Opinion will remain in effect and channel rehabilitation projects would continue under this coverage.

In 2000, the California Fish and Game Commission (Commission) received a petition to list coho salmon north of San Francisco as an endangered species under provisions of the CESA. The Commission required that a comprehensive, statewide coho salmon recovery strategy and plan be developed while they considered the petition. The coho recovery plan was adopted by the Commission in February 2004 (California Department of Fish and Game 2004). The Commission declined to list the coho under CESA in June 2004 on a split vote. On August 5, 2004, the Commission made the decision to list the California portion of the SONCC ESU coho as threatened north of Punta Gorda.

The green sturgeon was petitioned for listing under the ESA in 2001. After a lengthy review, in 2003 the NMFS determined that the species does not warrant listing. In April 2005, NMFS proposed to list North American green sturgeon south of the Eel River (the southern distinct population segment, or DPS); because of concerns over the uncertainty and availability of data, the northern DPS was placed on NMFS' Species of Concern List and its status will be reassessed within five years if information warrants. There is no evidence to suggest that this species is present in the Trinity River above Burnt Ranch Falls.

The Pacific lamprey, along with three other lamprey species, was petitioned for federal listing in 2003. On December 27, 2004, the USFWS announced that the petition along with additional information does not present substantial scientific or commercial information indicating that listing of these species may be warranted (CFR Vol. 64, No. 86, December 27, 2004).

The Klamath Mountains Province (KMP) ESU of steelhead, which includes stocks from the Trinity River, was proposed for federal listing as threatened on March 16, 1995; however, on February 7, 1998, NMFS determined that the population did not warrant threatened status, but that it did warrant candidate status (as defined by NMFS). Subsequent information on the KMP ESU steelhead was evaluated and NMFS made a final listing determination that the ESU did not warrant listing in April 2001 (CFR Vol. 66, No. 65). The summer-run population segment of this ESU remains a California Species of Special Concern, as well as a USFS sensitive species (Moyle et al. 1995; U.S. Fish and Wildlife Service 1995).

Similarly, in a 1998 status review of all west coast Chinook salmon stocks (Myers et al. 1998), the Upper Klamath-Trinity Rivers ESU Chinook salmon was determined to not warrant listing as a threatened or endangered species. However, spring-run Chinook salmon within the Klamath-Trinity basin is a California Species of Special Concern (Moyle et al. 1995). The 2005 NMFS status review did not reveal new information that would warrant listing of the upper Klamath-Trinity ESU Chinook salmon (Good et al. 2005).

4.6.2 Environmental Impacts and Mitigation Measures

Methodology

The following section provides a brief overview of the analytic methods used to assess potential impacts of the Proposed Project on fisheries resources. These methods included a comprehensive literature search and focused field surveys.

Evaluation of the presence of special-status fish species and sensitive habitats within the boundaries of the Remaining Phase 1 and Phase 2 sites established for the project was conducted by performing a database search of the CNDDB, informally consulting with resource agencies (e.g., CDFG, NMFS, and USFWS), and reviewing environmental documents and technical studies prepared for projects in the vicinity. Representatives from the USACE, CDFG, NMFS, USFWS, HVT, and YT were contacted to discuss specific biological resource issues associated with the project, including potential impacts and suggested mitigation measures.

Aquatic habitat within the 40-mile reach below Lewiston Dam was identified and characterized based on the USFWS mesohabitat delineations map, reconnaissance-level site visits, consultation with local fishery biologists, and review of pertinent literature and data. These efforts were conducted to provide an overview of the quality and character of potential suitable spawning, holding, and rearing habitat present within this reach.

Significance Criteria

Significance criteria used to assess the potential impacts of the project on fisheries resources are based on the current scientific understanding of the biological requirements and ecological status of the species of interest, and the regulatory standards of county, state, and federal agencies, including the CEQA Guidelines. A significant impact on anadromous salmonids and other native fish would occur if the project would result in any of the following:

- potential to substantially reduce the number or restrict the range of an endangered or threatened native fish species or a native fish species that is a candidate for state listing or proposed for federal listing as endangered or threatened;
- potential for substantial reductions in the habitat of any native fish species other than those that are listed as endangered or threatened or are candidates or proposed for endangered or threatened status;
- potential for causing a native fish population to drop below self-sustaining levels;
- substantial adverse effect, either directly or through habitat modifications, on any native anadromous species identified as a sensitive or special-status fish species in local or regional plans, policies, or regulations;
- substantial interference with the movement of any native anadromous or resident fish species;
- a conflict with, or violation of, the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan relating to the protection of native anadromous species or resident fish species;
- mortality of state or federally listed fish species, or species that are candidates for listing or proposed for listing;

- reductions in the size of the population of a native fish species sufficient to jeopardize its long-term persistence;
- temporary impacts to habitats such that native fish species suffer increased mortality or lowered reproductive success that jeopardizes the long-term persistence of those local populations;
- permanent loss of designated critical habitat and/or essential habitat of a listed species or special-status native fish species; or
- reduction in the quantity or quality of habitats in which native fish species populations occur sufficient to reduce the long-term abundance and productivity of local populations.

Impacts and Mitigation Measures

The following sections provide detailed descriptions of the potential impacts to fishery resources and mitigation measures for each alternative evaluated in this document. To reduce redundancy and improve readability, the impacts to the federally and state listed SONCC ESU coho salmon, other special-status species (i.e., "species of special concern" for CEQA), and non-listed fish species are described together under each action alternative. Because the threshold for "significance" of an impact is lower (i.e., more restrictive) for threatened and endangered species, impacts are described separately when they differ among species.

The effects have been evaluated for the principal species of interest and address the full range of potential impacts to anadromous and resident riverine fishes within the boundaries of the Remaining Phase 1 and Phase 2 sites. Table 4.6-3 summarizes the potential fishery resource impacts that would result from implementation of the project.

Table 4.6-3. Summary of Fishery Resource Impacts for the No-Project Alternative, Proposed Project, and Alternative 1

No-Project Alternative	Proposed Project	Alternative 1	Proposed Project with Mitigation	Alternative 1 with Mitigation
Impact 4.6-1. Implementation of the project could result in effects on potential spawning and rearing habitat for anadromous fishes, including the federally and state listed coho salmon.				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.6-2. Implementation of the project could result in increased erosion and sedimentation levels that could adversely affect fishes, including the federally and state listed coho salmon.				
No impact	Significant	Significant	Less than significant	Less than significant

Table 4.6-3. Summary of Fishery Resource Impacts for the No-Project Alternative, Proposed Project, and Alternative 1

No-Project Alternative	Proposed Project	Alternative 1	Proposed Project with Mitigation	Alternative 1 with Mitigation
Impact 4.6-3. Construction activities associated with the project could potentially result in the accidental spill of hazardous materials that could adversely affect fishes, including the federally and state listed coho salmon				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.6-4. Construction activities associated with the project could result in the mortality of rearing fishes, including the federally and state listed coho salmon.				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.6-5. Implementation of the project would result in the permanent or temporary loss of SRA habitat for anadromous salmonids.				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.6-6. Implementation of the project would result in fish passage being temporarily impaired during the in-stream construction phase.				
No impact	Significant	Significant	Less than significant	Less than significant

Impact 4.6-1: Implementation of the project could result in effects on potential spawning and rearing habitat for anadromous fishes, including the federally and state listed coho salmon. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, the rehabilitation and sediment management activities described in Chapter 2 would not be implemented; therefore, there would be no adverse effects on spawning and rearing habitat other than those associated with the current ongoing programs, projects, and activities described in Chapter 5. In addition to the previously constructed mechanical channel rehabilitation projects at Hocker Flat, Canyon Creek, Indian Creek, and Lewiston-Dark Gulch, Reclamation has an ongoing responsibility to provide the flows prescribed in the ROD and implement additional channel rehabilitation and sediment management activities necessary to meet the project objectives. Authorized TRRP projects, combined with ongoing watershed restoration efforts by the USFS, BLM, Trinity County, HVT, and YT are expected to provide meaningful benefits to these fishery resources. While the No-Project alternative is expected to improve the quality and quantity of fish habitat, it would not ensure that the TRRP meets the fundamental project objectives to restore fish populations and increase spawning or rearing habitat for anadromous fish, including coho salmon within the Trinity River.

Proposed Project

Coho Salmon

No permanent adverse effects on spawning habitat for coho salmon within the boundaries of the Remaining Phase 1 or Phase 2 sites would occur. The permanent effects would be substantial and beneficial. The long-term design objective is that implementation of the Proposed Project along with the flow management regime implemented by the TRRP would reactivate channel migration across the floodplain within the boundaries of the project sites. This dynamic fluvial channel would result in a net increase in point bar surface area through coarse sediment deposition; thereby, increasing riffle-spawning habitat within the project boundary. The addition of coarse sediment (including spawning sized gravels) to the Trinity River at select coarse sediment activity areas would immediately provide suitably sized spawning gravels to coho and other salmonids.

Adverse effects on spawning habitat associated with the Proposed Project are expected to be limited to short-term, localized sedimentation caused by construction activities in and immediately adjacent to the active Trinity River channel. Any salmon redds (i.e., nests) on or near the existing in-channel activity areas could be destroyed or disturbed by these construction activities. Silt suspended by these activities may be dispersed and re-settle on downstream suitable spawning areas near these construction areas. However, in-channel activities would be conducted during late-summer (July 15–September 15) low-flow conditions, as authorized by NMFS and CDFG, to avoid impacts to spawning anadromous salmonids. The addition of coarse sediment at various in-channel activity areas would sometimes occur in conjunction with bar construction activities and could affect spawning anadromous fish (including coho salmon). If in-stream work was allowed outside the current in-channel late-summer work period, this activity could result in percussive impacts to incubating embryos and mortality through compression (crushing) of embryos and alevins[3]. The addition of coarse sediment at various in-channel activity areas would also occur during the channel maintenance flows released from the TRD during the spring. While the volume of material introduced to the channel may vary by water year type, the timing would be based on the transport capacity of these flows. Planned placement of coarse sediment during peak ROD flows, starting approximately May 1, is late enough to eliminate detrimental effects on fish in the gravel because fry will have already emerged. In addition, extreme water velocities at the high flow injection sites would make these locations unsuitable for juvenile salmonids; therefore, eliminating the chance for them to be impacted by the gravel injections. High-flow placement of coarse sediment is not expected to have additional adverse effects on redds or juvenile salmonids beyond those that already would have occurred from scour and sediment transport of gravels already in the mainstem Trinity River.

Suitable rearing habitat for juvenile coho salmon and other salmonids occurs within the boundaries of the Remaining Phase 1 and Phase 2 sites, primarily along the river margins. Some temporary adverse effects on the quality of juvenile salmonid rearing habitat will occur through removal of riparian vegetation that contributes to SRA habitat at various sites throughout the 40-mile reach below Lewiston Dam. Temporary adverse effects to the quality of juvenile salmonid rearing habitat will occur during upland construction activities adjacent to the river channel (e.g., removal of SRA habitat) and in-channel

[3] A salmon fry whose yolk-sac is depleted.

construction activities (e.g., coarse sediment addition, temporary crossings, and grade control removal) The principal adverse effects on fish include displacement of rearing salmonid fishes from their habitat and an increased predation risk or reduced feeding efficiency through the loss of the cover function provided by the SRA habitat (Michney and Hampton 1984; Michney and Deibel 1986). The potential direct and indirect effects to fish resulting from increased suspended sediment and turbidity levels are addressed under Impact 4.6-2.

The limited and localized temporary impacts on rearing habitat are expected to be offset in the long-term by substantially more significant beneficial long-term increases in, and improved suitability of, physical rearing habitat associated with implementing the Proposed Project. These benefits will accrue from (1) the engineered floodplain habitat improvements, (2) overall reconnection of the floodplain to the river at low flows, (3) potential channel migration through the upper elevation floodplain, and (4) revegetation of the rehabilitated floodplain with native plant species that will contribute shade and large wood to the river channel. Improved river connection with the floodplain during high flows throughout the year is expected to increase areas of slow, shallow-water habitat preferred by salmonid fry. The process of channel migration through the floodplain may also create new shallow point bars, further increasing the availability of this preferred habitat. Within the project boundaries, the channel migration process and engineered side channel and alcove habitats will collectively increase the relative abundance of this preferred salmon rearing habitat compared to the existing condition.

Ultimately, the collective changes in channel morphology as a result of the Proposed Project, including activities at both the Remaining Phase 1 and Phase 2 sites, are intended to improve habitat diversity for all life-stages of anadromous salmonids. To enhance habitat complexity, large woody debris (LWD) would be strategically placed in restored side-channels and floodplain areas. The addition of LWD will provide complex physical habitat that would have important effects on juvenile and adult fish in the Trinity River in that it would create spawning and rearing habitat, increase nutrient and organic matter retention (which increases food production in the system), and provide refuge from predators and cover during high winter flows (Bustard and Narver 1975; Lestelle 1978; Lestelle and Cederholm 1982; Hicks et al. 1991; as cited in Cederholm et al. 1997). Although the adverse impacts to coho salmon would be temporary and localized, they are considered significant under the Proposed Project.

Chinook Salmon

Potential impacts and benefits to Upper Klamath-Trinity Rivers ESU Chinook salmon populations in the Trinity River would be generally similar to those described for coho salmon. Long-term benefits are expected to substantially outweigh temporary adverse effects. Spring- and fall-run salmon are known to spawn and rear within the boundaries of the Remaining Phase 1 and Phase 2 sites. Spring-run Chinook salmon juveniles can be expected to rear year-round in and adjacent to these sites and may be displaced by in-channel work activities. Additionally, adult spring-run salmon over-summer in the deeper run and pool habitats at various locations in this reach prior to spawning. No permanent adverse impacts to spring-run Chinook salmon holding habitat would occur. The Proposed Project does not include activities that would directly fill, modify, or otherwise affect the quality or quantity of spring-run holding habitat in the Trinity River. Temporary effects on spring-run holding habitat associated with construction of the

Proposed Project are expected to be limited to short-term, localized increases in turbidity caused by bank-side excavation activities or in-channel work activities. The potential effects of increased suspended sediment and turbidity to holding adult spring-run Chinook salmon are addressed under Impact 4.5-2.

Steelhead

Potential impacts and benefits to the KMP ESU steelhead populations in the Trinity River resulting from implementation of the Proposed Project would be generally similar to those described for coho and Chinook salmon. Long-term benefits are expected to substantially outweigh temporary adverse effects. Summer and winter runs of KMP ESU steelhead are known to migrate and stage and may spawn within the project boundaries established for the Proposed Project.

Pacific Lamprey

Potential impacts and benefits to Pacific lamprey populations would be similar to those previously described for salmon and steelhead. Adult Pacific lampreys migrate upstream to spawn from spring through early summer and again in the fall. The removal of riparian vegetation that contributes to SRA habitat within the project boundary could have a temporary impact on adult Pacific lamprey by reducing holding and hiding habitat, which is particularly important for upstream migrant adults. However, the implementation of TRRP's riparian vegetation management plan should alleviate this impact over the longer term.

Alternative 1

Coho Salmon

Rehabilitation activities under Alternative 1 would be similar to those described for the Proposed Project; however, the location, type, and magnitude of these activities would be less than under the Proposed Project, but would still be considered significant. While most of the expected benefits of the Proposed Project would occur under this alternative, particularly at the Remaining Phase 1 sites, the timeframe to achieve these benefits may be extended. Although Alternative 1 would provide benefits to coho salmon, the temporary and localized impacts to spawning and rearing habitat would be significant.

Chinook Salmon

Alternative 1 would result in lesser construction-related impacts to spawning, holding, and rearing habitat for Upper Klamath-Trinity Rivers ESU Chinook salmon due to the reduced nature of the surface disturbance at the Remaining Phase 1 and Phase 2 sites. Although Alternative 1 would provide benefits to Chinook salmon, the temporary and localized impacts to spawning and rearing habitat would be significant.

Steelhead

Alternative 1 would result in lesser construction-related impacts to spawning and rearing habitat for KMP ESU steelhead due to the reduced nature of the surface disturbance at the Remaining Phase 1 and Phase 2 sites. Although Alternative 1 would provide benefits to KMP ESU steelhead, the temporary and localized impacts to spawning and rearing habitat would be significant.

Pacific Lamprey

Alternative 1 would result in lesser construction-related impacts to spawning and rearing habitat for Pacific lamprey due to the reduced nature of the surface disturbance at the Remaining Phase 1 and Phase 2 sites. Although Alternative 1 would provide benefits to Pacific lamprey, the temporary and localized impacts to spawning and rearing habitat would be significant.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

4.6-1a The proposed construction schedule avoids in-channel work during the period in which it could affect spawning spring- and fall-run Chinook salmon, coho salmon, and steelhead or their embryos once in the gravel. As directed by the 2000 Biological Opinion (National Marine Fisheries Service 2000), Reclamation will ensure that all in-channel construction activities are conducted during late-summer, low-flow conditions (e.g., July 15–September 15).

4.6-1b Alluvial material used for coarse sediment additions will be composed of washed, spawning-sized gravels (3/8- to 5-inches diameter) from a local Trinity River basin source. Gravel will be washed to remove any silts, sand, clay, and organic matter and will be free of contaminants, such as petroleum products. Washed gravel will pass Caltrans cleanliness test #227 with a value of 85 or greater.

Significance after Mitigation

Less than significant

Impact 4.6-2: Implementation of the project could result in increased erosion and sedimentation levels that could adversely affect fishes, including the federally and state listed coho salmon. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, there would be no increase in erosion or sedimentation levels that could adversely affect fish species because the project would not be constructed.

Proposed Project

Coho Salmon

Activities related to implementation of the Proposed Project would result in the temporary, localized loss of vegetation and general disturbance to the bed and banks of the Trinity River. Removal of vegetation and soil could accelerate erosion processes within the boundaries of the Remaining Phase 1 and Phase 2 sites and increase the potential for sediment delivery to the Trinity River. The clarity of a water body is related to the concentration of suspended solids, which are predominantly less than 0.5 millimeters (mm) in diameter. Water clarity has been measured as the concentration of suspended solids (mg/l) or more recently as turbidity, measured in nephelometric turbidity units (NTUs). Turbidity generally does not cause acute adverse affects to aquatic organisms unless the concentrations are extremely high (Lloyd 1985). Noggle (1978) estimated an acute lethal concentration, causing 50 percent mortality of juvenile coho salmon, at 1,200 mg per liter (mg/L) during summer (approximately 900 NTU). At relatively high levels, suspended solids can adversely affect the physiology and behavior of aquatic organisms and may suppress photosynthetic activity at the base of food webs, affecting aquatic organisms either directly (e.g. ability to feed) or indirectly (e.g. impact to food supply and spawning substrate) (Alabaster and Lloyd 1980). However, at lower levels, effects of turbidity last as long as the perturbation in clarity and are limited to reducing reactive distance to prey as well as predation risk. For instance, if periods of turbidity occurred during periods of merganser (fish predator) activity, the turbidity would probably be an overall benefit to the fish (Harvey, pers. comm. 2009). In the lab, benthic feeding success of coho salmon in water with turbidity levels as high as 100 NTU has been found to be at least 70 percent of their feeding success in clear water (Harvey and White 2008). In-channel and riverine activities would disturb the alluvial materials that constitute the bed and banks of the Trinity River. Exposed soils on the upland and staging areas are susceptible to mobilization from rainfall during early season runoff events. In-channel excavation is planned as part of the Proposed Project; therefore, it is expected that excavation and operation of heavy equipment will resuspend silt and sand, which will result in localized and temporary increases of suspended sediment and turbidity.

Operation of heavy equipment in the active channel during restoration activities would likely resuspend streambed sediments but is not likely to add fine sediments to the river. Use of washed, spawning-sized gravels and the cleaning of vehicle wheels prior to crossing the channel will minimize the effects of this action on fish habitat. Any juvenile coho salmon rearing in the area during in-channel restoration-related construction activities may be temporarily displaced or their social behavior may be temporarily disrupted by turbidity created during this activity.

Erosion and deposition of fine sediments associated with implementation of the Proposed Project are expected to be localized and temporary. Some fine-textured materials may settle near or on known spawning habitats located downstream of riverine rehabilitation areas, but these materials are not expected to impair redd excavation or spawning due to remobilization of this material and deposition on upper margins of the channel. In-channel construction activities, such as excavation, grading, and coarse sediment addition, would occur during low-flow conditions between July 15 and September 15, minimizing the potential for adverse effects on all life stages of coho salmon. Any juvenile coho salmon rearing in these activity areas during this timeframe could be temporarily displaced or their social behavior could be temporarily disrupted by an increase in turbidity. Behavioral disruption, even temporarily, could result in some increased vulnerability of juvenile coho salmon to competitive interactions or predation (Berg and Northcote 1985). These temporary impacts were anticipated and addressed in the 2000 Biological Opinion (National Marine Fisheries Service 2000) and associated Incidental Take Statement for the ROD and amended BO for in-channel work. While the Proposed Project is intended to substantially improve aquatic habitat, the short-term adverse impacts associated with construction activities would be considered significant.

Chinook Salmon

Potential impacts to Upper Klamath-Trinity Rivers ESU Chinook salmon populations would be generally similar to those described for coho salmon. Consequently, re-suspension of fine-textured sediment, potential erosion and sediment runoff, and elevated turbidity for short distances downstream could occur during the migration, spawning, and rearing seasons. Spring- and fall-run Chinook salmon are known to spawn in suitable habitats encompassed by the project boundary. Construction activities are proposed during the spawning period, though in-channel construction is scheduled outside the spawning period and therefore would not displace holding adult salmonids. Some fine-textured materials may settle near or on known spawning habitats located downstream of riverine rehabilitation areas, but these materials are not expected to impair redd excavation or spawning. Spring-run Chinook salmon juveniles are expected to rear throughout the year within the boundaries of the Remaining Phase 1 and Phase 2 sites and transient increases in turbidity and re-suspension of sediments would be likely to have similar effects on juvenile Chinook salmon as on coho salmon. Adult spring-run Chinook salmon using holding habitat during the summer months may be displaced to other holding habitats either upstream or downstream by transient turbidity and sediment plumes created by construction activity.

Steelhead

Potential impacts to the KMP ESU steelhead populations in the Trinity River would be similar to those previously described for coho and Chinook salmon. Summer and winter runs of KMP ESU steelhead are known to migrate, stage (as adults), and rear (as juveniles) within the boundaries of the Remaining Phase 1 and Phase 2 sites throughout the proposed construction season. Both runs generally spawn during the winter.

Pacific Lamprey

Potential impacts to Pacific lamprey populations in the Trinity River would be similar to those previously described for coho salmon and other anadromous salmonids. Adult Pacific lampreys migrate upstream to spawn from spring through early summer and again in the fall, and siltation of nests could occur (e.g., those in low-gradient riffles). Larval lampreys inhabit the river year-round. Filter feeding by larval lampreys could be disrupted by an increase in suspended sediments caused by construction-related erosion, although this impact would be localized and temporary.

Alternative 1

<u>Coho Salmon</u>

Alternative 1 would result in a reduction in the temporary effects on coho salmon from erosion, sedimentation, and turbidity due to the overall decrease in the location, number, and magnitude of activities compared to those described for the Proposed Project. While the expected benefits of the Proposed Project would also occur under this alternative, these benefits would be reduced under Alternative 1. Although Alternative 1 is intended to increase aquatic habitat over the existing condition, the short-term impacts associated with construction activities would be considered significant.

<u>Chinook Salmon</u>

Alternative 1 would result in erosion, sedimentation, and turbidity impacts to Upper Klamath-Trinity Rivers ESU Chinook salmon similar to those previously described for coho salmon.

<u>Steelhead</u>

Alternative 1 would result in temporary effects on KMP ESU steelhead from erosion and sedimentation similar to those previously described for coho salmon.

<u>Pacific Lamprey</u>

Alternative 1 would result in temporary effects on Pacific lampreys from erosion and sedimentation similar to those previously described for coho salmon.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

4.6-2a The water quality objective for turbidity levels in the Trinity River, as listed in the Basin Plan for the North Coast Region (North Coast Regional Water Quality Control Board 2007), is summarized below.

- Turbidity levels shall not be increased more than 20 percent above naturally occurring background levels. Allowable zones of dilution within which higher percentages can be tolerated may be defined for specific discharges upon the issuance of discharge permits or waiver thereof.

- Due to the nature of the proposed restoration activities and the clarity of the Trinity River during low flow conditions, the Regional Water Board has determined that an allowable zone of turbidity dilution is appropriate and necessary in order for Trinity River restoration activities to be accomplished in a meaningful, timely, and cost-effective manner that fully protects beneficial uses without resulting in a violation of the water quality objective for turbidity.

- Project activities that occur in areas outside of the active river channel will not increase turbidity levels by more than 20 percent above naturally occurring background levels. During in-river construction activities and until the first extended period of post-construction high flow (i.e., flows of at least 6,000 cfs inundate the project areas and floodplain for a minimum of 7 days) a zone of turbidity dilution within which higher percentages would be tolerated will be defined in discharge permits as the full width of the river channel within 500 linear feet downstream of any project activity that increases naturally occurring background levels, provided that all other required controls and appropriate BMPs for sediment and turbidity control are in place and downstream beneficial uses are also fully protected. When naturally occurring background levels are less than or equal to 20 NTUs, turbidity levels immediately downstream of the zone of turbidity dilution shall not exceed 20 NTUs. If naturally occurring background levels are greater than 20 NTUs, turbidity levels immediately downstream of the 500 linear foot zone of dilution shall not be increased by more than 20 percent above the naturally occurring background level.

4.6-2b To ensure that turbidity levels do not exceed the thresholds described above (4.6-2a) during in-river project construction activities, Reclamation shall monitor turbidity levels upstream within 50 feet of project activities (i.e., natural background) and 500 feet downstream of the in-river construction activities that could increase turbidity. At a minimum, field turbidity measurements shall be collected whenever a visible increase in turbidity is observed. Monitoring frequency shall be a minimum of every two hours during in-river work periods and when activities commence that are likely to increase turbidity levels above any previously monitored levels.

If grab sample results indicate that turbidity levels exceed 20 NTU at 500 feet downstream from construction activities, remedial actions will be implemented to reduce and maintain turbidity at or below 20 NTU immediately downstream of the 500 linear foot zone of dilution. Potential remedial actions include halting or slowing construction activities and implementation of additional BMPs until turbidity levels are at or below 20 NTU.

4.6-2c Fill gravels used on the streambeds, stream banks, and river crossings will be composed of washed, spawning-sized gravels from a local Trinity River basin source. Gravel will be washed to remove any silts, sand, clay, and organic matter and will be free of contaminants such as petroleum products. Washed gravel will pass Caltrans cleanliness test #227 with a value of 85 or greater.

4.6-2d Reclamation will prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) that describes BMPs for the project, including silt fences, sediment filters, and routine monitoring to verify effectiveness. Proper implementation of erosion and sediment controls will be adequate to minimize sediment inputs into the Trinity River until vegetation regrowth occurs. All required controls and BMPs, including sediment and erosion control devices, will be inspected daily during the construction period to ensure that the devices are properly functioning. Excavated and stored materials will be kept in upland activity areas with erosion control properly installed and maintained. Excavated and stored materials will be staged in stable upland activity areas. All applicable erosion control standards will be required during stockpiling of materials.

4.6-2e To minimize the potential for increases in turbidity and suspended sediments entering the Trinity River as a result of access routes (e.g., roads), Reclamation will implement the following protocols:

- Keep bare soil to the minimum required by designs. Erosion control devices/measures will be applied to areas where vegetation has been removed to reduce short-term erosion prior to the start of the rainy season.
- Keep runoff from bare soil areas well dispersed. Dispersing runoff keeps sediment on-site and prevents sediment delivery to streams. Direct any concentrated runoff from bare soil areas into natural buffers of vegetation or areas with more gentle slopes where sediment can settle out.
- Disconnect and disperse flow paths, including roadside ditches, that might otherwise deliver fine sediment to stream channels.
- Decompact or rip floodplain areas so that surfaces are permeable and no surface water runoff occurs.

Significance after Mitigation

Less than significant

Impact 4.6-3: Construction activities associated with the project could potentially result in the accidental spill of hazardous materials that could adversely affect fishes, including the federally and state listed coho salmon. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project alternative, there would be no risk of accidental spills of hazardous material because the project would not be constructed. Therefore, there would be no impact.

Proposed Project

<u>Coho Salmon</u>

Construction activities typically include the refueling of construction equipment on location. As a result, minor fuel and oil spills could occur, and there would be a risk of larger releases from locations along the river. Without rapid containment and clean up, these materials could be toxic, depending on the location of the spill in relation to surface water features, including the Trinity River. Oils, fuels, and other contaminants could have deleterious effects on all salmonid life stages in close proximity to construction activities. These impacts, while short-term, would be considered significant.

<u>Chinook Salmon</u>

Potential impacts to Upper Klamath-Trinity Rivers ESU Chinook salmon populations in the Trinity River resulting from the accidental spill of hazardous materials would be similar to those previously described for coho salmon.

<u>Steelhead</u>

Potential impacts to KMP ESU steelhead populations in the Trinity River resulting from accidental spill of hazardous materials would be similar to those previously described for coho salmon.

<u>Pacific Lamprey</u>

Potential impacts to Pacific lamprey populations in the Trinity River resulting from accidental spill of hazardous materials would be similar to those previously described for coho salmon.

Alternative 1

The risk of, and impacts resulting from, construction-related accidental spills of hazardous materials associated with Alternative 1 would be similar to, but less than, those associated with the Proposed Project for all anadromous fish species due to an overall reduction in construction activities. These impacts would be significant.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

4.6-3a Construction specifications will include the following measures to reduce potential impacts associated with accidental spills of pollutants (fuel, oil, grease, etc.) on vegetation and aquatic habitat resources within the project boundary:

- Equipment and materials will be stored away from wetland and surface water features.
- Vehicles and equipment used during construction will receive proper and timely maintenance to reduce the potential for mechanical breakdowns leading to a spill of materials. Maintenance and fueling will be conducted in an area at least 150 feet away from waters of the Trinity River or within an appropriate secondary fueling containment area.
- The contractor will develop and implement site-specific BMPs, a water pollution control plan, and emergency spill control plan. The contractor will be responsible for immediate containment and removal of any toxins released.

Section 4.5, Water Quality, and section 4.15, Hazards and Hazardous Materials, provide additional details on mitigation measures developed for water quality standards, hazards, and hazardous materials.

Significance after Mitigation

Less than significant

Impact 4.6-4: Construction activities associated with the project could result in the mortality of rearing fishes, including the federally and state listed coho salmon. *No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.*

No-Project Alternative

Under the No-Project Alternative, construction-related mortality to rearing salmonids would not occur because the project would not be constructed. Therefore, there would be no impact.

Proposed Project

Coho Salmon

Coho salmon are known to occur throughout the Trinity River. Suitable coho salmon rearing habitat exists within the boundaries of the Remaining Phase 1 and Phase 2 project sites, and juvenile coho salmon may be expected to rear within these boundaries year-round. Adult coho migrate through the boundaries and use suitable spawning habitat throughout the 40-mile reach below Lewiston Dam. Direct injury to, or mortality of, coho salmon could occur during in-channel construction activities (e.g., excavation of existing grade control structures, coarse sediment addition including grading, and use of temporary river crossings). In-channel restoration construction activities would be conducted only during late-summer, low-flow conditions (e.g., July 15 – September 15), minimizing the potential for direct mortality to rearing coho, since this period corresponds to a time of the year when the fewest number of juvenile coho salmon are known to occur in the project reach.

NMFS expects that all displaced juvenile fish, including coho salmon, will find suitable habitat within river reaches downstream of the project, since juvenile rearing habitat in the mainstem Trinity River is likely under-saturated during summer and fall months (National Marine Fisheries Service 2006). The construction period identified above would completely avoid the spawning period for coho salmon; therefore, direct impacts to adult coho salmon or their embryos/alevins would not occur. However, during spring flow events direct impacts to juvenile coho salmon could occur during the annual, long-term augmentation of coarse sediment at the sites identified on Figure 1-2. Augmentation methods may vary by site, and could be subject to change based on flows. Methods could include injection by positioning the material along the channel margin for distribution by the river at high spring flows, or by delivering the material to the mid-channel via mechanized equipment. Augmentation during high-flows is not expected to have additional adverse effects on redds or juvenile salmonids because the areas chosen for coarse sediment augmentation are high velocity sites where juvenile fish will not be holding and high concentrations of redds would not be expected. Additionally, scour and sediment transport in the Trinity River associated with high flow events would likely impact any existing redds at gravel augmentation sites prior to gravel augmentation.

A small, temporary, but uncertain level of stranding of coho salmon fry could occur on the newly excavated constructed inundation surfaces and side channels during rapidly receding flood-flow periods during the winter and early spring when fry are emerging. Additionally, construction of side-channel features could result in stranding conditions as flows recede, particularly if the downstream end fills with fine sediments, potentially stranding coho salmon fry. Although stranding of fry under such receding flood conditions occurs on naturally shallow floodplains and in flood bypasses (Sommer 2001), the constructed features could increase this process to varying degrees. All of the constructed inundation surface designs incorporate a downstream slope equal to that of the river channel as well as high flow scour channels (chutes). These features would drain in a downstream direction that would be guided toward the river channel by earthwork contours to minimize the potential for stranding. As fluvial channel migration occurs across these inundated surfaces, the potential for fry stranding is expected to equilibrate to that of a natural stranding risk. While the activities included in the Proposed Project are intended to benefit coho salmon, the short-term construction impacts would be significant.

Chinook Salmon

Potential impacts to Upper Klamath-Trinity Rivers ESU Chinook salmon populations in the Trinity River resulting from implementation of the Proposed Project would be similar to those previously described for coho salmon. Physical construction in and directly adjacent to the river channel could disturb holding adult spring-run Chinook salmon. The principal effect to adult spring-run is that they would be forced to relocate to suitable holding habitat. The Proposed Project would not impair migration, and adult spring-run would be able to locate and use suitable holding habitat outside of the disturbed areas. Water temperatures are the coolest in the reach of the Trinity River encompassed by the project boundaries, and physiological effects, or ultimately death, are not expected, as temperatures in this reach of the Trinity

River (13–15 °C) are below the threshold observed where adult spring-run Chinook salmon can accumulate stresses. Based on the proximity of the boundaries of the Remaining Phase 1 and Phase 2 sites to holding habitat observed in 2003/2004 and ongoing studies on temperature tolerance, temperatures in this section of the Trinity River are sufficiently cool that adult spring-run are able to deal with stressors (e.g., relocation) without adverse effect.

Steelhead

Potential impacts to the KMP ESU steelhead populations in the Trinity River resulting from implementation of the Proposed Project would be similar to those previously described for coho and Chinook salmon.

Pacific Lamprey

Potential impacts on Pacific lamprey populations in the Trinity River resulting from implementation of the Proposed Project would be similar to those previously described for other anadromous salmonids.

Alternative 1

Construction-related mortality of adult and juvenile salmonids and Pacific lamprey associated with Alternative 1 would be similar to, but less than, that associated with the Proposed Project for adult and juvenile fish due to an overall reduction in the construction activities. While the activities included in Alternative 1 are intended to benefit salmonids and other aquatic organisms, the potential for mortality would be significant.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

4.6-4a To avoid impacts to spawning and incubating salmonids, instream work will only occur between July 15 and September 15.

4.6-4b To avoid or minimize potential injury and mortality of fish during riverine activities (e.g. removal of grade control structures, channel crossings, and addition and grading of coarse sediment), equipment will be operated slowly and deliberately to alert and scare adult and juvenile salmonids away from the work area.

4.6-4c Reclamation will minimize potential injury and mortality of fish during the use of low-flow channel crossings. This will be accomplished by minimizing vehicle traffic and by operating equipment and vehicles slowly and deliberately to alert and scare adult and juvenile salmonids away from the crossing area, or by having a person wade ahead of equipment to scare fish away from the crossing area.

4.6-4d To avoid or minimize potential injury and mortality of fish during excavation and placement of fill materials in the active low-flow channel, equipment will be operated slowly and deliberately to alert and scare adult and juvenile salmonids away from the work area. Reclamation will ensure that before submerging an excavator bucket or laying gravel below the water surface, the excavator bucket will be operated to "tap" the surface of the water, or a person will wade ahead of fill placement equipment to scare fish away from the work area. To avoid impacts to mobile life stages of salmonids that may be present in the water column, the first layers of clean gravel that are being placed into the wetted channel will be added slowly and deliberately to allow fish to move from the work area.

4.6-4e To avoid impacts to juvenile salmonids during high flow gravel injections, gravel will only be injected in select locations where water velocities are too high and juvenile salmonids would not be expected to be holding.

4.6-4f Monitoring of the constructed inundation surfaces for salmon fry stranding will be performed by a qualified fishery biologist immediately after recession of flood flow events designated as a 1.5- year or less frequent event (i.e., $Q \geq 6{,}000$ cfs) for a period of 3 years following construction. These flows, and associated fry stranding surveys, would typically occur between January and May. If substantial stranding is observed, Reclamation will take appropriate measures to return stranded fishes to river habitats and to subsequently modify the constructed surfaces prior to the next managed flow release to reduce the likelihood of future occurrences of fry stranding.

Significance after Mitigation

Less than significant

Impact 4.6-5: Implementation of the project would result in the permanent or temporary loss of SRA habitat for anadromous salmonids. *No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.*

No-Project Alternative

Under the No-Project alternative, additional loss of SRA habitat along the Trinity River would not occur because the project would not be constructed. Under this alternative, other restoration projects implemented by the TRRP and other entities would occur, consistent with federal, state, and local requirements. Although some of these projects would result in loss of SRA habitat, this loss has been considered outside of the analysis provided in this document. Therefore, there would be no impact.

Proposed Project and Alternative 1

For the purposes of this document, the term riparian habitat encompasses the range of riparian vegetation conditions within the boundaries of the project sites and is synonymous with SRA habitat. It does not have a specific legal description or definition.

Coho Salmon, Chinook Salmon, and Steelhead

Removal of montane riparian wetland vegetation along the banks of the Trinity River within the boundaries of the Remaining Phase 1 and Phase 2 sites could adversely affect the quality of rearing habitats used by salmonids. These adverse effects are expected to be ephemeral, and long-term impacts will be beneficial as riparian vegetation is restored to a state more closely resembling pre-dam conditions with increased native species and increased diversity in ages and species composition.

Riparian vegetation is important to the maintenance of healthy fish habitat. Riparian areas provide shade and temperature benefits; sediment, nutrient, and chemical regulation; stream bank stability; and inputs of LWD and organic matter to the channel. Riparian vegetation that is adjacent to the river, a component of SRA habitat, is an element of designated critical habitat for the SONCC ESU coho salmon and a component of EFH for Chinook and coho salmon. However, complexity in the riparian environment is also an important component of fish habitat; such complexity would be increased under the Proposed Project.

Removal of the riparian berm and re-activation of adjacent floodplains and side-channels in activity areas would allow for natural revegetation of most of the riparian habitat (a mixture of willows, alders, and cottonwoods) that would be removed during berm removal and other excavation activities. Under either the Proposed Project or Alternative 1, large seed trees (willow and cottonwood) and other large nest trees would be left intact. Additionally, riparian habitat removed under either action alternative would be replaced consistent with the TRRP Riparian Revegetation and Monitoring Plan. While no permanent net loss of SRA features would necessarily occur, the short-term impact of removing riparian vegetation is considered a significant impact.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

To maintain overall SRA habitat values in the project reach, the Proposed Project would be designed to minimize losses of riparian vegetation adjacent to the Trinity River channel, except where necessary to re-activate river access to the floodplain. Boundary markers will be installed along all riparian areas outside of delineated rehabilitation activity areas. These markers will prevent construction access so that impacts to riparian vegetation are minimized. To compensate for the loss of riparian vegetation in the project boundaries, Reclamation will implement the following measures:

4.6-5a Prior to the start of construction activities, Reclamation will retain a qualified biologist to identify potential construction access routes necessary for the project to ensure that these features avoid and/or minimize to the fullest extent impacts to riparian habitats and wetland waters. In addition, Reclamation will clearly identify, and flag in the field, biologically sensitive areas (e.g., jurisdictional waters and riparian habitat) to be protected, and will provide the contractor with specific instructions to avoid any construction activity within these features. Reclamation will inspect and maintain flagged areas on a regular basis throughout the construction phase.

4.6-5b Reclamation will continue to implement the Riparian Revegetation and Monitoring Plan during Proposed Project implementation. The plan acknowledges that the ultimate goals of the TRRP include enhancement and maintenance of functional riparian habitat and no net-loss of riparian habitat and jurisdictional wetlands within channel rehabilitation site boundaries and generally throughout the 40-mile reach of the Trinity River below the TRD.

4.6-5c Reclamation will initiate a 10-year mitigation monitoring program after the first growing season following project implementation. After a period of 3 years, the need for additional riparian habitat and wetland enhancement will be evaluated. At that time, Reclamation, in consultation with the USACE, Regional Water Board, and CDFG, will determine whether there is a need to further enhance or create additional areas of riparian habitat or jurisdictional wetlands within the project boundary so that there will be no net loss of riparian habitat after a 10-year monitoring period. In addition, wetlands will be redelineated 5 years post-project implementation to ensure no net loss of wetland habitat. Riparian habitat reporting 3 years after project implementation and wetland delineation 5 years after implementation will provide Reclamation with needed data in a timely fashion to take additional pro-active measures towards meeting the goals of no net loss of riparian and jurisdictional wetland habitat within Project site boundaries after 10 years.

Significance after Mitigation

Less than significant

Impact 4.6-6: Implementation of the project would result in fish passage being temporarily impaired during the in-stream construction phase. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project alternative, temporary impairment of fish passage would not occur because the project would not be constructed. Therefore, there would be no impact.

Proposed Project

Coho Salmon

Construction activities associated with the Proposed Project may require temporary placement of low-flow channel crossings, which consist of gravel fill materials or temporary bridges. The crossings will be constructed to maintain adequate water depths and velocities for fish passage. The low water crossings would be used to move heavy equipment across the low-flow channels to access activity areas on opposite banks of the Trinity River or its tributaries. Construction activities could require service vehicles to cross up to several times per week; otherwise, vehicle crossing traffic would be kept to a minimum. Temporary gravel fill work ramps and low-flow channel crossings would be constructed to extend across the width of the low-flow channel and are expected to be in-place long enough to complete work in these activity areas. Construction involving in-channel activities will be completed only between July 15 and September 15. However, construction at the edge of the active low-flow channel may occur during both summer and autumn months (between July and December). Access in and out of the sites could be required during other low-flow times as well. Construction of the crossings on the mainstem Trinity River would only be conducted during late-summer, low-flow conditions (e.g., July 15–September 15). However, crossings of the river or tributaries at low-flow conditions during other months (e.g., October–December) may occur via a bridge. Consequently, it is likely that some work adjacent to the channel would occur during the coho salmon spawning period.

Use of river crossings could occur during the onset of the fall coho smolt emigration, depending on seasonal conditions (flow, temperatures, etc.) and would occur during the coho adult migration and spawning period. Upon completion of work in riverine areas requiring use of low-flow channel crossings, these crossings would be dismantled and materials would be contoured to the river bottom. Fill materials would consist of appropriately sized spawning gravel from Phase 1 or Phase 2 TRRP sites as specified by NMFS and CDFG.

Fish passage design is normally based on the weakest species or life stage present that requires upstream access and should accommodate the weakest individual within that group. For the Proposed Project, low-flow channel crossings would need to meet velocity criteria for upstream migrating juvenile salmonids and depth criteria for migrating adult salmonids, including the federally threatened coho salmon. Maximum velocities and minimum depths are adopted from NMFS Guidelines for Salmonid Passage at Stream Crossings (National Marine Fisheries Service 2001) and Part IX Fish Passage Evaluation at Stream Crossings of CDFG's California Salmonid Stream Habitat Restoration Manual (California Department of Fish and Game 2003).

Although the construction period could extend into the smolt emigration and coho salmon spawning season, the effect of the low-water crossings on fish passage is expected to be temporary and minimal. Adult anadromous fish generally expend approximately 80 percent of their stored energy reserve during normal upstream migration to suitable spawning areas. Undue exertion or delay at stream-road crossings due to unsuccessful passage attempts at inadequate (blocking) structures can lead to reduced spawning success and pre-spawning mortality (Robison et al. 1999). Adequate depth and velocities over the crossing will allow both juvenile and adult passage. While long-term beneficial changes to physical rearing habitat associated with implementing the Proposed Project are anticipated, the temporary impacts on fish passage would be considered significant.

In the event that a temporary bridge is required to implement an activity (as described in Section 2.3) all in-channel activities within the mainstem Trinity River will be restricted to the timeframes outlined in the 2000 Biological Opinion (National Marine Fisheries Service 2000).

Chinook Salmon

Potential impacts to Upper Klamath-Trinity Rivers ESU Chinook salmon populations in the Trinity River would be similar to those previously described for coho salmon. However, adult migrants from the spring and fall runs of Chinook salmon would be expected to pass through, stage, and/or spawn within the project boundaries during the construction season. The temporary placement of gravel fill at low-flow channel crossings would not preclude fish passage since adequate depths and velocities will be maintained at the crossings.

Steelhead

Potential impacts to the KMP ESU steelhead populations in the Trinity River resulting from implementation of the Proposed Project would be similar to those previously described for coho and Chinook salmon.

Pacific Lamprey

Potential fish passage impacts to Pacific lamprey populations in the Trinity River resulting from implementation of the Proposed Project would be similar to those previously described for coho and Chinook salmon and steelhead.

Alternative 1

Coho Salmon

Impacts to coho salmon resulting from temporary impairments to fish passage during the in-stream construction phase for Alternative 1 would be similar to, but less than, those associated with the Proposed Project due to an overall reduction in the number of stream crossings. These impacts would be significant.

Chinook Salmon

Potential impacts to Upper Klamath-Trinity Rivers ESU Chinook salmon populations in the Trinity River would be similar to those previously described for coho salmon.

Steelhead

Potential impacts to the KMP ESU steelhead populations in the Trinity River resulting from implementation of Alternative 1 would be similar to those previously described for coho and Chinook salmon.

Pacific Lamprey

Potential fish passage impacts to Pacific lamprey populations in the Trinity River resulting from implementation of Alternative 1 would be similar to those previously described for coho and Chinook salmon and steelhead.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

4.6-6a Low water crossings will only be constructed and used between July 15 and September 15. Fill gravels used on the low-water crossings, streambeds, and stream banks will be composed of washed, spawning-sized gravels from a local Trinity Basin source. Gravel will be washed to remove any silts, sand, clay, and organic matter and will be free of contaminants such as petroleum products. Washed gravel will pass Caltrans cleanliness test #227 with a value of 85 or greater. Abutment and embankment materials used for bridges will be native alluvium obtained from within the boundaries of the Remaining Phase 1 or Phase 2 sites.

4.6-6b Reclamation will construct the low-flow channel crossings to allow adequate depths and velocities for adult and juvenile salmonids to pass safely. Flows associated with storm events are not considered critical because the width and hydrologic conditions associated with low-flow channel crossings in the Trinity River are not considered to limit fish passage at elevated flows and would be comparable to hydrologic conditions in local riffle-and-run features. For Trinity River low-flow channel crossings at base flows, velocities will not exceed 2 feet per second to allow for juvenile fish passage and water depths will not be less than 12 inches in two-thirds of the river channel to provide adequate depth for adult salmon and steelhead passage.

4.6-6c The number of vehicle and equipment crossings of the Trinity River will be minimized.

4.6-6d Reclamation will not impede the physical features or hydraulic process of the Trinity River in a fashion that would be inconsistent with the 2000 Biological Opinion (National Marine Fisheries Service 2000), or result in a temporary impairment to fish passage related to a bridge.

Significance after Mitigation

Less than significant

SECTION 4.7

Vegetation, Wildlife, and Wetlands

4.7 Vegetation, Wildlife, and Wetlands

This section describes the biological resources known to occur in the Trinity River basin in proximity to the proposed Remaining Phase 1 and Phase 2 sites. It also evaluates potential impacts to biological resources from implementation of the Proposed Project and its alternatives.

4.7.1 Environmental Setting

Riparian vegetation is most prevalent along the Trinity River from the Lewiston Dam downstream to the confluence with the North Fork Trinity River. This reach includes approximately 330 acres of early-successional, willow-dominated vegetation; 170 acres of more mature, later-successional, alder-dominated vegetation; and 380 acres of willow-alder mix (U.S. Fish and Wildlife Service et al. 1999). Between the North Fork and the South Fork, the mainstem Trinity River channel is constrained by canyon walls that limit riparian vegetation to a narrow band. In comparison to upstream reaches below Lewiston Dam, peak flows in this reach have been less affected by dam operations. Between the South Fork and the Klamath River, the Trinity River alternates between confined reaches with little riparian vegetation to alluvial reaches with vegetation similar to pre-dam conditions in the reach between Lewiston Dam and the North Fork. At Trinity and Lewiston reservoirs, plant species consist of those typically found in standing water and include floating species, rooted aquatic species, and emergent wetland species. Emergent wetland and riparian vegetation is constrained by fluctuating water levels and steep banks.

Many wildlife species that inhabited river and riparian habitats prior to the TRD still occur along the Trinity River, although species that prefer early-successional stages or require greater riverine structural diversity likely occurred in greater abundance prior to the TRD. Species commonly present prior to the TRD likely included the rough-skinned newt (*Taricha granulosa*), western aquatic garter snake (*Thamnophis couchi*), foothill yellow-legged frog (*Rana boylii*), western pond turtle *(Actinemys marmorata*), and American dipper (*Cinclus mexicanus*). Wildlife species that foraged on the abundant Chinook salmon (*Oncorhynchus tshawytscha*) and steelhead (*Oncorhynchus mykiss*) runs, such as the black bear (*Ursus americanus*), bald eagle (*Haliaeetus leucocephalus*), and other scavengers, were also common along the pre-dam Trinity River (U.S. Fish and Wildlife Service et al. 2000).

The post-dam flow regime established conditions that favored upland habitat at the expense of wetland and aquatic habitat. The shift in habitat types is a causative factor in the current depressed populations of aquatic, semi-aquatic, and wetland wildlife species compared to terrestrial species. Species such as the western pond turtle, an example of a semi-aquatic species, have declined since construction of the TRD in response to diminishing quality and abundance of riverine habitat. In contrast, species that favor mature, late-successional riparian habitats, such as the northern goshawk (*Accipiter gentiles*) and black salamander (*Aneides flavipunctatus*), prefer the current mature conditions (U.S. Fish and Wildlife Service et al. 2000).

The TRD reservoirs attract resting and foraging waterfowl and other species that favor standing or slow-moving water. Impounded water in the reservoirs also provides important foraging habitat for eagles and other raptors that prey on fish and waterfowl.

Overview of Plant Communities

The following plant community descriptions follow the nomenclature used in Sawyer and Keeler-Wolf (1995) and *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer 1988) except for the foothill pine and open water categories, which are not included in either of these references.

Annual Grassland

This annual grassland plant community is commonly dominated by introduced annual grass species, including wild oats (*Avena fatua*), soft brome (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), cheatgrass (*Bromus tectorum*), and hare barley (*Hordeum murinum* ssp. *leporinum*). Common forbs include broadleaf filaree (*Erodium botrys*), redstem filaree (*E. cicutarium*), California poppy (*Eschscholzia californica*), turkey mullein (*Eremocarpus setigerus*), true clovers (*Trifolium* spp.), burclover (*Medicago polymorpha*), and many others.

Barren

Barren land consists primarily of rock, pavement, and sand. Vegetation is usually not present, although sparse opportunistic grasses and forbs or weedy species may occur. Barren land occurs as gravel bars adjacent to the river as well as other areas throughout the sites.

Foothill Pine

Foothill pine (*Pinus sabiana*) (also known as gray pine) is the dominant overstory species present in foothill pine communities. Understory vegetation includes common manzanita (*Arctostaphylos patula*), buck brush (*Ceanothus cuneatus*), skunkbrush (*Rhus trilobata*), and poison oak (*Toxicodendron diversilobum*). The herbaceous layer includes ripgut brome, cheatgrass, and false hedge-parsley (*Torilis arvensis*).

Fresh Emergent Wetland

Fresh emergent wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. Typically, the dominant plant species include narrow-leaf cattail (*Typha angustifolia*), Himalayan blackberry (*Rubus discolor*), perennial ryegrass (*Lolium perenne*), and narrow-leaved willow (*Salix exigua*). In the project area, fresh emergent wetlands are found in landscape depressions and at the edge of the Trinity River and its tributaries.

Klamath Mixed Conifer

Klamath mixed conifer habitats typically are tall, dense to moderately open, needle-leaved evergreen forests with patches of broad-leaved evergreen and deciduous low trees and shrubs. This habitat is dominated by tall evergreen conifers up to 200 feet in height with a rich shrub layer and well-developed herbaceous layers. On more xeric sites, the habitat is a generally open but very diverse forestland, having a well-developed shrub layer. The overstory layer is characterized by a mixture of conifers. Typical dominant conifers in the project area are white fir (*Abies concolor*) and Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*). Occasional broadleaf trees include golden chinquapin (*Chrysolepis chrysophylla*), canyon live oak (*Quercus chrysolepis*), and black oak (*Q. kelloggii*).

Mixed Chaparral

Mixed chaparral is a structurally homogeneous brushland type dominated by shrubs with thick, stiff, heavily cutinized evergreen leaves. The dominant species typically include greenleaf manzanita (*Arctostaphylos patula*) and buck brush.

Montane Hardwood

In montane hardwood communities, typical dominant tree species include Pacific madrone (*Arbutus menziesii*), bigleaf maple (*Acer macrophyllum*), canyon live oak, and black oak. Associated shrub species include common manzanita (*Arctostaphylos manzanita*), buck brush, skunkbrush, snowberry (*Symphoricarpos albus* var. *laevigatus*), and poison-oak. The underlying herbaceous layer includes ripgut brome, cheatgrass, blue wild rye (*Elymus glaucus*), silver bush lupine (*Lupinus albifrons*), purple sanicle (*Sanicula bipinnatifida*), and false hedge-parsley.

Montane Hardwood-Conifer

In the northern interior of California, the montane hardwood-conifer community consists of at least one-third conifer and at least one-third broadleaf trees scattered throughout the landscape in a mosaic-like pattern of small pure stands of conifers interspersed with small stands of broad-leaved trees (Holland 1986; Mayer and Laudenslayer 1988). Geographically and biologically, this plant community often serves as an ecotone between dense coniferous forest and montane hardwood, mixed chaparral, or open woodland vegetation types.

Dominant tree species typically observed include Pacific madrone, bigleaf maple, ponderosa pine (*Pinus ponderosa)*, gray pine (*Pinus sabiana*), Douglas-fir, canyon live oak, and black oak. Shrub species include common manzanita, buck brush, cascara (*Rhamnus purshiana*), skunkbrush, snowberry, and poison-oak. The underlying herbaceous layer includes ripgut brome, cheatgrass, blue wild rye, silver bush lupine, purple sanicle, and false hedge-parsley.

Montane Riparian

Montane riparian communities occur adjacent to and below the ordinary high water mark of the Trinity River, as well as other relatively wet locations. In Trinity County, dominant tree species typically occurring in this community include bigleaf maple, white alder (*Alnus rhombifolia*), Oregon ash (*Fraxinus latifolia*), black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), and Goodding's black willow (*Salix gooddingii*). Typical understory species include mugwort (*Artemisia douglasiana*), virgin's bower (*Clematis ligusticifolia*), American dogwood (*Cornus sericea*), Oregon golden-aster (*Heterotheca oregona*), dalmatian toadflax (*Linaria genistifolia* ssp. *dalmatica*), white sweet clover (*Melilotus alba*), musk monkeyflower (*Mimulus moschatus*), straggly gooseberry (*Ribes divaricatum*), Himalayan blackberry, California blackberry (*Rubus ursinus*), narrow-leaved willow, arroyo willow (*Salix lasiolepis*), shining willow (*S. lucida*), and California wild grape (*Vitis californica*).

Open Water

Open water habitat consists of deep-water areas that exhibit perennial inundation. Vascular plant species are typically limited to the edges of this habitat because the water depth inhibits sunlight from reaching to the channel bottom where vegetation would typically be rooted.

Perennial Grassland

Perennial grassland habitat typically occurs on ridges and south-facing slopes, alternating with forest and scrub in the valleys and on north-facing slopes. Species present in this habitat include a variety of introduced and native perennial species, including sedge (*Carex* spp.).

Ponderosa Pine

As the name implies, the dominant overstory species in ponderosa pine communities is ponderosa pine. Understory vegetation typically includes common manzanita, buck brush, and poison-oak. The underlying herbaceous layer includes ripgut brome and cheatgrass.

Riverine

Riverine habitat (Trinity River) is common to all Remaining Phase 1 and Phase 2 sites. The portion of the river where the rehabilitation sites are located is dominated by run and riffle areas, with boulder, cobble, gravel, and sand substrates. Vegetation in the active river channel is sparse, with occasional clumps of sedges.

Wildlife Resources

The plant communities described above occur in a complicated mosaic in the project area, providing habitat for a wide variety of wildlife species. A discussion of the species typically found in these communities is provided below.

Annual Grassland

Annual grasslands are productive wildlife habitat. Grassland bird species, such as the mourning dove (*Zenaida macroura*), savannah sparrow (*Passerculus sandwichensis*), and white-crowned sparrow (*Zonotrichia leucophrys*), as well as rodents, including the California ground squirrel (*Spermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), California kangaroo rat (*Dipodomys californicus*), and deer mouse (*Peromyscus maniculatus*), forage on the seed crop this community provides. These species, in turn, attract predators such as the gopher snake (*Pituophis melanoleucus*), American kestrel (*Falco sparverius*), red-tailed hawk (*Buteo jamaicensis*), and coyote (*Canis latrans*). Reptile species expected to occur here include the western fence lizard (*Sceloporus occidentalis*), western skink (*Eumeces skiltonianus*), western rattlesnake (*Crotalus viridis*), and yellow-bellied racer (*Coluber constrictor*).

Barren

Barren habitat provides few resources for wildlife species. Some species associated with adjacent habitats likely forage on the bare soil to some extent, and killdeer (*Charadrius vociferus*) may nest here. However, use of this habitat by wildlife is expected to be limited.

Foothill Pine

Numerous birds feed on the seeds of foothill pine, including the northern flicker (*Colaptes auratus*), Steller's jay (*Cyanocitta stelleri*), acorn woodpecker (*Melanerpes formicivorus*), and band-tailed pigeon (*Patagioenas fasciata*). The foliage, bark, and seeds also provide food for gray squirrels (*Sciurus griseus*), and black-tailed deer (*Odocoileus hemionus columbianus*) browse the foliage and twigs.

Fresh Emergent Wetland

Fresh emergent wetland provides habitat for breeding and larval development of amphibians, such as the western toad (*Bufo boreas*), Pacific chorus frog (*Pseudacris regilla*), and non-native bullfrog (*Rana catesbeiana*). This community also provides habitat for waterbirds, such as the green heron (*Butorides striatus*) and mallard (*Anas platyrhynchos*), as well as roosting and nesting habitat for the red-winged blackbird (*Agelaius phoeniceus*).

Klamath Mixed Conifer

Klamath mixed conifer habitat provides a wide array of nesting and foraging opportunities for wildlife. Species commonly found in this habitat include the mountain quail (*Oreotyx pictus*), hairy woodpecker (*Picoides villosus*), sharp-shinned hawk (*Accipiter striatus*), western gray squirrel, and gray fox (*Urocyon cinereoargenteus*). The leaf litter also provides habitat for reptiles and amphibians, such as the California kingsnake (*Lampropeltis zonata*) and ensatina (*Ensatina eschscholtzii*).

Mixed Chaparral

Mixed chaparral provides habitat for a wide variety of wildlife species. It provides seeds, fruit, and protection from predators and adverse weather. In addition, it provides singing, roosting, and nesting sites for many species of birds, including the California quail (*Callipepla californica*), wrentit (*Chameae fasciata*), and Bewick's wren (*Thryomanes bewickii*). Mammals common in this habitat include the black-tailed jackrabbit (*Lepus californicus*), gray fox, coyote, and deer mouse. Reptiles that make use of this habitat include the western fence lizard and southern alligator lizard (*Elgaria multicarinata*).

Montane Hardwood-Conifer

The variability of the canopy cover and understory vegetation makes montane hardwood-conifer communities suitable for numerous species of wildlife. Hollow trees and logs provide denning sites for mammals such as the coyote, while cavities in mature trees are used by cavity-dwelling species such as the acorn woodpecker, violet-green swallow (*Tachycineta thalassina*), northern flicker, great horned owl (*Bubo virginianus*), raccoon (*Procyon lotor*), and pallid bat (*Antrozous pallidus*). In addition, raptors, such as the red-tailed hawk, construct nests in the upper canopy of mature trees. Moreover, mast crops and conifer seeds are an important food source for many birds and mammals, including the Steller's jay, acorn woodpecker, California quail, black-tailed deer, and western gray squirrel. In moist areas, many amphibians and reptiles are found in the detrital layer, including ensatina and western fence lizards. Snakes, including the western rattlesnake and sharp-tailed snake (*Contia tenuis*), also occur in this community.

Montane Riparian

Riparian woodlands represent some of the most important wildlife habitats due to their high floristic and structural diversity, high biomass (and therefore high food abundance), and high water availability. In addition to providing breeding, foraging, and roosting habitat for a diverse array of species, riparian habitats also provide movement corridors, connecting a variety of habitats throughout a region.

The leaf litter, fallen tree branches, and logs associated with the riparian communities in the project area provide cover for amphibians, such as the western toad and Pacific chorus frog. The western fence lizard, western skink, and southern alligator lizard are also expected to occur here. Species commonly nesting and foraging primarily in the riparian tree canopy include the tree swallow (*Tachycineta bicolor*), bushtit (*Psaltriparus minimus*), white-breasted nuthatch (*Sitta carolinensis*), and Nuttall's and downy woodpeckers (*Picoides nuttallii* and *P. pubescens*, respectively). Other resident species, such as the spotted towhee (*Pipilo maculatus*) and song sparrow (*Melospiza melodia*), nest and forage on or very close to the ground, usually in dense vegetation. A variety of mammals also occurs in riparian communities, including the deer mouse, raccoon, and Virginia opossum (*Didelphis virginiana*).

Open Water

Open water provides foraging habitat to waterfowl, such as the mallard and Canada goose (*Branta canadensis*). In addition, bats, black phoebes (*Sayornis nigricans*), tree swallows, and other birds that feed on insects found over water sources likely forage over this habitat. Further, open water provides habitat for amphibians and reptiles such as the western toad, Pacific chorus frog, and common garter snake (*Thamnophis sirtalis*).

Perennial Grassland

The suite of animals using this habitat is similar to that found in annual grasslands. For both types of grassland, the value of the habitat is enhanced by the variety of habitats surrounding it, which provide shelter for species that forage in the open grasslands. Perennial grasslands support several herbivores, including black-tail deer, California ground squirrels, Botta's pocket gophers, deer mice, and black-tailed jackrabbits. These species attract predators that breed in adjacent habitats, such as the bobcat (*Lynx rufus*), coyote, red-tailed hawk, and great-horned owl. Reptile species expected to occur here include the western fence lizard, western skink, and gopher snake.

Ponderosa Pine

Ponderosa pine needles, cones, buds, pollen, twigs, seeds, and associated fungi and insects provide food for many species of birds and mammals, including the mountain quail, western gray squirrel, black-tailed deer, and Allen's chipmunk (*Tamias senex*), and the needles are eaten by blue grouse (*Dendragapus obscurus*). Mature trees provide nesting habitat for raptors such as the sharp-shinned hawk and red-tailed hawk, while snags and hollow logs provide shelter for species such as the Virginia opossum and western spotted skunk (*Spilogale gracilis*).

Riverine

The Trinity River provides potential habitat for several native and introduced fish species (see section 4.6). Amphibians and reptiles expected to occur here include the Pacific chorus frog, western toad, bullfrog, and western pond turtle. In addition, birds such as the mallard, great blue heron (*Ardea herodias*), osprey (*Pandion haliaetus*), and belted kingfisher (*Ceryle alcyon*) may forage here. Mammals expected to occur in this habitat include the river otter (*Lutra canadensis*) and beaver (*Castor canadensis*). Bats, including the Yuma myotis (*Myotis yumanensis*) and big brown bat (*Eptesicus fuscus*), forage above this habitat on warm evenings.

Special-Status Species

In Trinity County, the communities described above provide habitat for a number of special-status plant and wildlife species. For the purposes of this evaluation, special-status species are (1) designated as rare by the CDFG or the USFWS or are listed as threatened or endangered under the CESA or the federal ESA; (2) proposed for designation as rare or listing as threatened or endangered; (3) state or federal candidate species for listing as threatened or endangered; (4) identified by the CDFG as Species of Special Concern or California Fully Protected Species; (5) designated as sensitive by the BLM or USFWS; or (6) plants designated as California Native Plant Society (CNPS) List 1A, 1B, or 2 (California Native Plant Society 2008).

Species designated “BLM sensitive” are not federally or state listed as endangered or threatened, nor are they proposed or candidates for listing; rather, they are designated by BLM’s State Director for special management consideration. BLM Manual Section 6840 defines sensitive species as “…those species (1) that are under status review by the USFWS/NMFS; or (2) whose numbers are declining so rapidly that Federal listing may become necessary, or (3) with typically small and widely dispersed populations; or (4) that are inhabiting ecological refugia or other specialized or unique habitats.” Existing California-BLM policy concerning the designation of sensitive species identifies two conditions that must be met before a species may be designated sensitive: (1) a significant population of the species must occur on BLM-administered lands, and (2) the potential must exist for improvement of the species’ condition through BLM management. BLM’s policy provides sensitive species with the same level of protection afforded federal candidate species.

A USFS “sensitive species” is any species of plant that has been recognized by the Regional Forester to need special management in order to prevent it from becoming threatened or endangered. The National Forest Management Act (NFMA) requires the USFS to “provide for a diversity of plant and animal communities” [16 U.S.C. 1604(g)(3)(B)] as part of its multiple use mandate. The USFS must maintain “viable populations of existing native and desired non-native species in the planning area” (36 CFR 219.19). The sensitive species program is designed to meet this mandate and to demonstrate the USFS’ commitment to maintaining biodiversity on National Forest System lands.

A list of special-status plant species considered for the Proposed Project was compiled by performing searches of the California Natural Diversity Database (CNDDB) and CNPS Electronic Inventory database (Appendix I), informally consulting with the CDFG and USFWS, and reviewing biological literature for the project region, including BLM's special-status plants list for the Redding Field Office (U.S. Bureau of Land Management 2005). A list of federal special-status species potentially occurring in Trinity County was obtained from the USFWS on March 25, 2008. The list includes species potentially occurring in Trinity County that have endangered, threatened, or candidate status (Appendix J). Table 4.7-1 lists the special-status plant species analyzed for their potential to occur in the project area.

A list of special-status wildlife species considered for analysis in this environmental document was compiled by performing a CNDDB database search (Appendix I), conducting informal consultations with the CDFG and USFWS, and reviewing biological literature for the region. Habitat information for special-status wildlife species was excerpted from the following sources:

- the California Department of Fish and Game, Habitat Conservation Planning Branch website (California Department of Fish and Game 2008);
- Amphibian and Reptile Species of Special Concern in California (Jennings and Hayes 1994);
- California's Wildlife, Volume II: Birds (Zeiner et al. 1990a);
- California's Wildlife, Volume III: Mammals (Zeiner et al. 1990b);
- California's Wildlife, Volume I: Amphibians and Reptiles (Zeiner et al. 1990c); and
- California Wildlife Habitat Relationships Program, Version 8.1 (California Department of Fish and Game 2005).

The special-status wildlife species that occur in the project region are described in Table 4.7-2 and more detailed species accounts are provided in Appendix C. Federal and state designations, general habitat requirements, and information on each species' potential occurrence at the sites (based on distributional range and available habitat) are also provided in the table. Conclusions presented are based on the knowledge of local professional biologists and historic survey information.

Table 4.7-1. Special-Status Plant Species Considered for Analysis

Common Name *Scientific Name*	Status[1] (Fed/State/ CNPS)	General Habitat	Flowering Period	Comments
Federally or State Listed Species				
McDonald's rock cress *Arabis macdonaldiana*	E/E/1B	Crevices, cracks, and margins of rocks on barren to shrub-covered, shallow, rocky, ultramafic soils (3,900–7,200 feet).	May–July	**Absent.** Not expected to occur at any of the project sites. Project sites do not contain ultramafic soils and are outside elevation range for this taxon.

Table 4.7-1. Special-Status Plant Species Considered for Analysis

Common Name *Scientific Name*	Status[1] (Fed/State/ CNPS)	General Habitat	Flowering Period	Comments
Other Special-Status Species				
Baker's globe mallow *Iliamna bakeri*	†/—/1B	Chaparral, pinyon, and juniper woodland/volcanic, often in burned areas (3,280–8,200 feet).	June–September	**May be Present.** Project sites may contain suitable habitat for this species. Thus, it may occur at any of the project sites.
Bay horsehair lichen *Sulcaria badia*	†/—/—	Hardwood trees (e.g., Oregon white oak) in areas with significant amount of fog and ambient humidity.	N/A	**Absent.** Does not occur at any of the project sites. BLM non-vascular plant surveys did not result in detection of this taxon.
Bottlebrush sedge *Carex hystericina*	*/—/2	Marshes, swamps, and wet places along stream banks (1,960–2,000 feet).	June	**May be Present.** Project sites may contain suitable habitat for this species. Thus, it may occur at any of the project sites.
California globe mallow *Iliamna latibracteata*	†/—/1B	Often on burned areas in chaparral, lower montane coniferous forest, North Coast coniferous forest, and riparian scrub (200–6,565 feet).	June–August	**May be Present.** Project sites may contain suitable habitat for this species. Thus, it may occur at any of the project sites.
Canyon Creek stonecrop *Sedum paradisum*	*†/—/1B	Granitic, rocky sites in broadleaved upland forest, chaparral, lower montane coniferous forest, and subalpine coniferous forest (960–6,500 feet).	May–July	**May be Present.** Project sites may contain suitable habitat for this species. Thus, it may occur at any of the project sites.
Clustered lady's-slipper *Cypripedium fasciculatum*	*†/—/4	Variety of soil types (including serpentinite) and often, but not always, associated with streams in mixed conifer or oak forests (1,300–6,000 feet).	March–July	**May be Present.** Project sites may contain suitable habitat for this species. Thus, it may occur at any of the project sites.
Dubakella Mountain buckwheat *Eriogonum libertini*	†/—/4	Openings in Jeffrey pine and incense-cedar woodland or chaparral, always on ultramafic soils (2,500–5,500 feet).	June–August	**Absent.** Not expected to occur at any of the project sites because they do not contain ultramafic soils.

Table 4.7-1. Special-Status Plant Species Considered for Analysis

Common Name ***Scientific Name***	**Status[1] (Fed/State/ CNPS)**	**General Habitat**	**Flowering Period**	**Comments**
Dudley's rush *Juncus dudleyi*	—/—/2	Wetlands or other wet areas in lower montane coniferous forest habitat (1,490–6,560 feet).	July–August	**May be Present.** Project sites are likely to contain suitable habitat for this species. It may occur at any of the project sites.
Elongate copper moss *Mielichhoferia elongata*	†/—/2	Usually on vernally mesic sites of metamorphic rock in cismontane woodland (1,640–4,265 feet).	N/A	**Absent.** BLM non-vascular plant surveys did not result in detection of this taxon.
English Peak greenbriar *Smilax jamesii*	*/—/1B	Broadleaved upland forest, lower and upper montane coniferous forests, marshes, swamps, and North Coast coniferous forest (2,900–7,500 feet).	May–July	**May be Present.** Project sites may contain suitable habitat for this species. Thus, it may occur at any of the project sites.
Flaccid sedge *Carex leptalea*	—/—/2	Marshes, swamps, wet meadows, bogs, fens, and wet places along stream banks (0–2,300 feet).	May–July	**May be Present.** Project sites are likely to contain suitable habitat for this taxon. Thus, it may occur at any of the project sites.
Fox sedge *Carex vulpinoidea*	—/—/2	Freshwater marshes, swamps, and riparian woodlands (100–4,000 feet).	May–June	**May be Present.** Project sites are likely to contain suitable habitat for this taxon. Thus, it may occur at any of the project sites.
Heckner's lewisia *Lewisia cotyledon* var. *heckneri*	*/—/1B	Outcrops and cliffs of various rock types, often near streams or rivers, in part to full shade, usually on northern aspects (730–6,900 feet).	May–July	**May be Present.** Project sites may contain suitable habitat for this species. Thus, it may occur at any of the project sites.
Howell's alkali grass *Puccinellia howellii*	*/—/1B	Meadows and mineralized seeps; known from a single location along highway 299 near Whiskeytown (1,600 feet).	April–June	**Absent.** Not expected to occur at any of the project sites because the sites do not contain mineralized seeps.
Howell's lewisia *Lewisia cotyledon* var. *howellii*	*/—/3	Rocky places in broadleaf upland and lower montane coniferous forests, chaparral, and cismontane woodland (490–6,600 feet).	April–July	**May be Present.** Project sites may contain suitable habitat for this species. Thus, it may occur at any of the project sites.

Table 4.7-1. Special-Status Plant Species Considered for Analysis

Common Name ***Scientific Name***	**Status[1] (Fed/State/ CNPS)**	**General Habitat**	**Flowering Period**	**Comments**
Howell's montia *Montia howellii*	†/—/2	Early-successional, vernally moist habitats, often on compacted fine sediments (<1,500 feet).	March–May	**May be Present.** Project sites may contain suitable habitat for this species. Thus, it may occur at any of the project sites.
Klamath Mountain catchfly *Silene salmonacea*	—/—/1B	Openings in lower montane coniferous forest; usually on serpentinite (2,540–3,430 feet).	June	**Absent.** Not expected to occur at any of the project sites. Sites do not contain ultramafic soils.
Moonwort, grape-fern *Botrychium* subgenus *Botrychium*	†/—/2	Fens, meadows, seeps, marshes, swamps, and mesic sites in fields, shrubby slopes, shady forests, and riparian areas (1,000–6,000 feet).	N/A	**May be Present.** Project sites are likely to contain suitable habitat for this taxon. Thus, it may occur at any of the project sites.
Mountain lady's-slipper *Cypripedium montanum*	*†/—/4	Variety of soil types and often associated with streams in mixed conifer, oak, and broad-leaved forests (1,300–6,000 feet).	March–August	**May be Present.** Project sites may contain suitable habitat for this species. Thus, it may occur at any of the project sites.
Nile's harmonia *Harmonia doris-nilesiae*	*†/—/1B	Dry, stony serpentine openings in mixed-conifer-oak forest on ridgetops and moderate to steep slopes (2,100–5,500 feet).	May–July	**Absent.** Not expected to occur at any of the project sites. Sites do not contain ultramafic soils.
Northern adder's-tongue fern *Ophioglossum pusillum*	†/—/1B	Marshes, swamps, and other mesic sites in valley and foothill grassland (3,280–6,560 feet).	July	**May be Present.** Project sites are likely to contain suitable habitat for this taxon. Thus, it may occur at any of the project sites.
Northern clarkia *Clarkia borealis* ssp. *borealis*	*†/—/1B	Chaparral, cismontane woodland, and lower montane coniferous forest (1,310–4,395 feet).	June–September	**May be Present.** Project sites are likely to contain suitable habitat for this taxon. Thus, it may occur at any of the project sites.
Oregon willow herb *Epilobium oreganum*	*†/—/1B	Generally on ultramafic soils of wet, gently sloping stream banks, meadows and fens in lower and upper montane coniferous forests (500–7,800 feet).	June–September	**May be Present.** Project sites may contain suitable habitat for this species. Thus, it may occur at any of the project sites.

Table 4.7-1. Special-Status Plant Species Considered for Analysis

Common Name ***Scientific Name***	**Status[1] (Fed/State/ CNPS)**	**General Habitat**	**Flowering Period**	**Comments**
Peanut sandwort *Minuartia rosei*	†/—/4	Gravelly serpentine barrens and openings in Jeffrey pine/ mixed conifer forest (2,500–5,800 feet).	May–July	**Absent**. Not expected to occur at any of the project sites because they do not contain ultramafic soils.
Pickering's ivesia *Ivesia pickeringii*	*†/—/1B	Lower montane conifer forests; seasonally wet meadows, swales, and rocky ephemeral stream beds on ultramafic soils (2,500–4,500 feet).	June–August	**Absent.** Not expected to occur at any of the project sites because they not contain ultramafic soils.
Regel's rush *Juncus regelii*	—/—/2	Meadows and wet places in upper montane coniferous forest habitat (2,500–6,230 feet).	August	**May be Present.** Project sites may contain suitable habitat for this species. Thus, it may occur at any of the project sites.
Scott Mountain fawn lily *Erythronium citrinum* var. *roderickii*	*†/—/1B	Montane forests on soils derived from serpentine or granitic parent material (2,900–4,000 feet).	March–April	**May be Present.** Project sites may contain suitable habitat for this species. Thus, it may occur at any of the project sites.
Scott Mountain bedstraw *Galium serpenticum* ssp. *scotticum*	*/—/1B	Steep serpentine talus slopes in lower montane coniferous forest (3,280–6,810 feet).	May–August	**Absent.** Not expected to occur at any of the project areas because they do not contain ultramafic soils.
Serpentine goldenbush *Ericameria ophitidis* (= *Haplopappus ophitidis*)	†/—/4	Serpentine semi-barrens or openings in Jeffrey pine and incense-cedar woodland (2,600–5,600 feet).	June–August	**Absent.** Not expected to occur at any of the project sites because they do not contain ultramafic soils.
Shasta chaenactis *Chaenactis suffrutescens*	*†/—/1B	Rocky open slopes, cobbly river terraces, and occasionally on road cuts, on serpentine soils or glacial till with ultramafics included (2,600–6,900 feet).	May–September	**Absent.** Not expected to occur at any of the project sites because they do not contain ultramafic soils.
Showy raillardella *Raillardella pringlei*	*†/—/1B	Fens, meadows, seeps, and mesic sites in upper montane coniferous forest on ultramafic soils (4,000–7,500 feet).	July–September	**Absent.** Not expected to occur at any of the project sites because they do not contain ultramafic soils.

Table 4.7-1. Special-Status Plant Species Considered for Analysis

Common Name *Scientific Name*	Status[1] (Fed/State/ CNPS)	General Habitat	Flowering Period	Comments
Stebbins' harmonia *Harmonia stebbinsii*	*†/—/1B	Shallow, rocky, ultramafic substrates; edges between timber and brush, roadsides on gently south-facing slopes (1,300–5,200 feet).	May–July	**Absent.** Not expected to occur at any of the project sites because they do not contain ultramafic soils.
Tedoc Mountain linanthus *Leptosiphon nuttallii* ssp. *howellii* (= *Linanthus n.* ssp. *h.*)	*†/—/1B	Openings in Jeffrey pine and incense-cedar woodland or chaparral, usually on ultramafic soils (4,000–9,190 feet).	May–July	**Absent.** Not expected to occur at any of the project sites because they do not contain ultramafic soils.
Thread-leaved beardtongue *Penstemon filiformis*	*†/—/1B	Rocky openings in lower montane woodlands and coniferous forests on ultramafic substrates (1,475–6,005 feet).	June–July	**Absent.** Not expected to occur at any of the project because they do not contain ultramafic soils.
Tracy's eriastrum *Eriastrum tracyi*	†/R/1B	Dry gravelly to loamy soils on flats and benches; closed cone pine forests or chaparral of the North Coast Ranges (1,000–4,300 feet).	June–July	**May be Present.** Project sites may contain suitable habitat for this species. Thus, it may occur at any of the project sites.
Veiny arnica *Arnica venosa*	†/—/4	Often on ridge tops and in disturbed areas, such as on old road cuts, in mixed conifer or conifer/oak forest in Trinity and Shasta counties (2,000–5,200 feet).	May–July	**May be Present.** Project sites may contain suitable habitat for this species. Thus, it may occur at any of the project sites.
Wolf's evening primrose *Oenothera wolfii*	—/—/1B	Coastal habitats and lower montane coniferous forests, usually on sandy, mesic substrates (9–2,625 feet).	May–October	**May be Present.** Project sites may contain suitable habitat for this species. Thus, it may occur at any of the project sites.
White beaked-rush *Rhynchospora alba*	—/—/2	Bogs, fens, meadows, marshes, and swamps (freshwater) (197–6,693 feet).	July–August	**May be Present.** Project sites are likely to contain suitable habitat for this taxon. Thus, it may occur at any of the project sites.

[1]Status Codes

Federal and State Codes:
E = Endangered; T = Threatened;
† = USFS Sensitive or Endemic
* = BLM Sensitive

CNPS Codes:
List 1B = Rare, Threatened or Endangered in CA and elsewhere
List 2 = Rare, Threatened, or Endangered in CA but common elsewhere
List 3 = More information is needed
List 4 = Limited distribution

Table 4.7-2. Special-Status Wildlife Species Considered for Analysis

Common Name *Scientific Name*	Status[1] (Fed/State)	General Habitat	Comments
Federally or State Listed Species			
Trinity bristle snail *Monadenia setosa*	—/T	Riparian corridors and canyon slopes with dense deciduous understory in Trinity County.	**Absent.** Species not detected during surveys of potential Trinity River restoration sites
California red-legged frog *Rana aurora draytonii*	T/SC	Requires aquatic habitat for breeding; also uses a variety of other habitat types, including riparian and upland areas.	**Absent.** Sites are not within the current or historic range of this species.
American peregrine falcon *Falco peregrinus anatum*	D/E, FP	Forages in many habitats; requires cliffs for nesting.	**Absent as breeder.** Project sites lack suitable nesting habitat, but the species may occur as a forager.
Bald eagle *Haliaeetus leucocephalus*	D/E	Uncommon to common in riverine and open wetland habitats. Requires large bodies of water or free-flowing rivers with abundant fish for foraging. Nests in large, live trees, usually near water and free from human disturbance.	**May be present.** Suitable nesting habitat is not present at the sites due to the lack of dense, large trees and the moderate level of human disturbance. However, the species may forage on the sites.
Northern spotted owl *Strix occidentalis caurina*	T/—	In northern California, resides in large stands of old growth, multi-layered, mixed conifer, redwood, and Douglas-fir habitats	**Absent.** No suitable habitat occurs within project boundaries.
Bank swallow *Riparia riparia*	—/T	Colonial nester on vertical banks or cliffs with fine-textured soils near water.	**Absent.** Suitable habitat is not present along the portion of the Trinity River being analyzed.
Marbled murrelet *Brachyramphus marmoratus*	T/E	Marine subtidal and pelagic habitats; requires dense, mature forests of redwood and Douglas-fir for breeding.	**Absent.** Suitable habitat is not present along the portion of the Trinity River being analyzed, and the area is not within the known range of the species.
Little willow flycatcher *Empidonax traillii brewsteri*	†/E	Rare summer resident in wet meadow and montane riparian habitats at 2,000 to 8,000 feet elevation.	**May be Present.** The montane riparian community in the region provides suitable habitat and the species has been observed along the Trinity River corridor (Wilson 1995; Miller et al. 2003; Herrera 2006).

Table 4.7-2. Special-Status Wildlife Species Considered for Analysis

Common Name ***Scientific Name***	**Status[1] (Fed/State)**	**General Habitat**	**Comments**
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	C†/E	Occurs in cottonwood/willow riparian forest.	**Absent.** Sites are not within the currently known range of the species.
California wolverine *Gulo gulo luteus*	†/T, FP	A variety of habitats at elevations between 1,600 and 14,200 feet. Most commonly inhabits open terrain above timberline.	**Absent.** Sites are not within the currently known range of the species.
Pacific fisher *Martes pennanti pacifica*	C*†/SC	Dens and forages in intermediate to large stands of old-growth forests or mixed stands of old-growth and mature trees with greater than 50% canopy closure. May use riparian corridors for movement.	**Absent as breeder.** This species is not expected to breed on the sites, but may use the Trinity River as a travel corridor.
Other Special-Status Species			
Tailed frog *Ascaphus truei*	—/SC	Clear, rocky, swift, cool perennial streams in densely forested habitats.	**Absent.** Suitable habitat is not present.
Foothill yellow-legged frog *Rana boylii*	*†/SC	Cool, fast-moving, rocky streams in a variety of habitats.	**May be present.** The species is known to occur in the Trinity River from the Lewiston Dam to the North Fork Trinity (California Department of Fish and Game 2003).
Cascades frog *Rana cascadae*	—/SC†	Open coniferous forests along the sunny, rocky banks of ponds, lakes, streams, and meadow potholes. From 2,600 to 9,000 feet elevation in Cascades and Trinity mountains.	**Absent.** The project sites are below the known elevational range of this species.
Western pond turtle *Actinemys marmorata*	†/SC	Slow water aquatic habitat with available basking sites. Require an upland oviposition (egg laying) site near the aquatic site.	**May be present.** Riverine and riparian habitats along the Trinity River provide suitable habitat.
Black swift *Cypseloides niger*	—/SC	Nests in moist crevices or caves or sea cliffs above the surf, or on cliffs behind, or adjacent to, waterfalls in deep canyons; forages widely over many habitats.	**Absent as breeder.** The project area does not provide suitable breeding habitat; however, the species may forage over the sites while migrating.

Table 4.7-2. Special-Status Wildlife Species Considered for Analysis

Common Name ***Scientific Name***	**Status[1] (Fed/State)**	**General Habitat**	**Comments**
California yellow warbler *Dendroica petechia brewsteri*	—/SC	Breeds in riparian woodlands, particularly those dominated by willows and cottonwoods.	**May be present.** Montane riparian habitat along the Trinity River in the project area provides suitable nesting and foraging habitats.
Golden eagle *Aquila chrysaetos*	—/SC, FP	Breeds on cliffs or in large trees or electrical towers, forages in open areas.	**Absent as breeder.** Suitable nesting habitat is absent from the sites; however, the species may occur as a forager.
Northern goshawk *Accipiter gentiles*	†/SC	Breeds in dense, mature conifer and deciduous forests, interspersed with meadows, other openings and riparian areas; nesting habitat includes north-facing slopes near water.	**May be present.** Woodlands along the Trinity River corridor provide suitable nesting and foraging habitats.
Vaux's swift *Chaetura vauxi*	—/SC	Prefers redwood and Douglas-fir habitats; nests in hollow trees and snags or, occasionally, in chimneys; forages aerially.	**May be present.** Suitable habitat is present in the project area.
Yellow-breasted chat *Icteria virens*	—/SC	Breeds in riparian habitats having dense understory vegetation, such as willow and blackberry.	**May be present.** Montane riparian habitat along the Trinity River in the project area provides suitable nesting and foraging habitats.
Fringed myotis *Myotis thysanodes*	*/—	In mesic habitats, roosts in caves, mines, tunnels, and buildings. Roosts typically in valley foothill hardwood and hardwood-conifer habitats, but forages in open, early-successional-stage habitats near water. Generally at 4,000-7,000 feet.	**Absent.** Project area is below the elevational limits of this species.
Long-eared myotis *Myotis evotis*	*/—	Found in most habitats, but prefers coniferous woodlands. Roosts in buildings, crevices, spaces under bark, and snags. Forages among trees and over brush, usually in close association with water.	**May be present.** Woodlands along the Trinity River corridor provide suitable roosting and foraging habitats.

Table 4.7-2. Special-Status Wildlife Species Considered for Analysis

Common Name ***Scientific Name***	**Status[1] (Fed/State)**	**General Habitat**	**Comments**
Oregon snowshoe hare *Lepus americanus klamathensis*	—/SC	In California, primarily found in montane riparian habitats and in stands of young conifers interspersed with chaparral. Dense cover is preferred. Primarily occurs in areas with relatively deep winter snow accumulation that persists for several months (Ellsworth and Reynolds 2006).	**Absent.** Suitable habitat is not present in the project area.
Pallid bat *Antrozous pallidus*	*†/SC	Forages over many habitats; roosts in buildings, large oaks or redwoods, rocky outcrops and rocky crevices in mines and caves.	**May be present.** Suitable habitat may be present along the Trinity River corridor.
Ring-tailed cat *Bassariscus astutus*	—/FP	Occurs in riparian habitats and brush stands of most forest and shrub habitats. Nests in rock recesses, hollow trees, logs, snags, abandoned burrows, and woodrat nests.	**May be present.** Montane riparian habitat along the Trinity River in the project area provides breeding and foraging habitat.
Townsend's western big-eared bat *Corynorhinus townsendii*	*†/SC	Roosts in colonies in caves, mines, bridges, buildings, and hollow trees in a range of habitats. Forages along habitat edges. Habitat must include appropriate roosting, maternity, and hibernacula sites free from disturbance by humans.	**May be present.** Suitable habitat is present along the Trinity River in the project area.
American marten *Martes americana*	†/—	Mixed evergreen forests with abundant cavities for denning and nesting and open areas for foraging.	**Absent.** Elevation at the project sites is below that required by the species.
Yuma myotis *Myotis yumanensis*	*/—	Forages over water such as ponds, streams, and stock tanks in open woodlands. Roosts in buildings, caves, mines, abandoned swallow nests, bridges, and rock crevices.	**May be present.** Suitable habitat is present along the Trinity River in the project area.

[1]Status Codes:
Federal and State Codes: E = Endangered; T = Threatened; D = Delisted; C = Candidate; SC = Species of Special Concern (State);
FP = California Fully Protected species
* = BLM Sensitive † = USFS Sensitive

Survey and Manage

Joe Molter, botanist for BLM, surveyed selected sites involving federal lands associated with the project area for vascular plant species included in the Survey and Manage Standards of the Northwest Forest Plan. A list of vascular plant species with the potential to occur was compiled by performing an Interagency Species Management System (ISMS) Database search and reviewing the Survey Protocols for the species listed in Table 1-1 of the amended ROD for the Northwest Forest Plan (U.S. Department of Agriculture and U.S. Department of Interior 2001) and the 2001 Survey and Manage Annual Species Review (USDA Forest Service and Bureau of Land Management 2002). This list included two species with the potential to occur in the project area: clustered lady's slipper (*Cypripedium fasciculatum*) and mountain lady's slipper (*Cypripedium montanum*). Neither species was observed during surveys in 2002.

Jeanne McFarland, botanist for BLM's Arcata Field Office, conducted pre-disturbance surveys in the project area for nonvascular plants and fungi, collectively known as cryptogams, in compliance with the Northwest Forest Plan ROD. The surveys, which were conducted during the summer of 2002, consisted of a close inspection of all suitable substrates for the fungus *Bridgeoporus nobilissimus* (the only pre-disturbance Survey and Manage fungus). No Survey and Manage cryptogamic species were present within the study limits, and no appropriate habitat for these species was identified within the study limits on public lands.

The Watershed Research and Training Center conducted mollusk surveys at proposed TRRP channel rehabilitation sites during the spring and fall of 2002. No Survey and Manage mollusk species were located at any of the sites. Many of the site boundaries were underwater (and therefore unsuitable for mollusk habitat) during May 2002 reservoir releases of 6,000 cfs. Based on this inundation and site-specific habitat quality, the majority of the surveyed lands were determined to be unsuitable habitat for Survey and Manage mollusk species.

Non-Native and Invasive Plant Species

Non-native and invasive plant species occur throughout the Trinity River corridor, particularly in areas that have been subject to ground-disturbing activities (e.g., roads and recreation sites). Reclamation acknowledges that such species have the potential to inhibit the TRRP's ability to restore the functions and values associated with riparian and upland vegetation along the Trinity River. As part of the overall TRRP program, Reclamation funded an effort to map the pre-restoration distribution and abundance of non-native species along the mainstem Trinity River corridor to the North Fork Trinity River. Ongoing monitoring will measure the response of these non-native species to the removal of existing vegetation and modification of the river's flow regime. In association with the mapping effort, species-specific management recommendations were developed to provide Reclamation with recommendations for applied control and management of invasive species to ensure that channel rehabilitation projects do not introduce or further spread non-native plants along the mainstem Trinity River.

Weed Management Areas (WMAs) are local organizations that bring together landowners and managers (private, city, county, state, and federal) in a county, multi-county, or other geographical area to coordinate efforts and expertise against common invasive (noxious) weed species. The WMAs function under the authority of a mutually developed memorandum of understanding (MOU) and are subject to statutory and regulatory weed control requirements. The lead agency for the WMAs is the California Department of Food and Agriculture (CDFA).

The Trinity County Weed Management Cooperative (TCWMC) acts as the local Trinity County WMA. TCWMC cooperators include the Trinity County Department of Agriculture, Trinity County Planning Department, USDA Natural Resources Conservation Service (NRCS), STNF, and the Trinity County Resource Conservation District (TCRCD). Trinity County has weed eradication programs in place for spotted knapweed (*Centaurea maculosa*), diffuse knapweed (*Centaurea diffusa*), dalmatian toadflax, and plumeless thistle (*Carduus acanthoides*). Other invasive species known to occur near the proposed sites include scotch broom (*Cytisus scoparius*), tree of heaven (*Ailanthus altissima*), Himalayan blackberry, and Dyer's woad (*Isatis tinctorius*).

Trinity County has several policies that discourage the use of synthetic herbicides for weed control. The Board of Supervisors has passed the following resolutions declaring forest herbicides a public nuisance:

- Resolution # 45-91 – April 2, 1991: Declares that the application of forestry herbicides in Trinity County is a public nuisance and that alternatives to forestry herbicides are available that create jobs. The resolution proclaims Trinity County timberlands an herbicide-free zone and requests forest managers not use herbicides on Trinity County timberlands.

- Resolution re-declaring the application of forest herbicides in Trinity County a public nuisance – April 7, 1997: This resolution identifies dangers associated with herbicide use and declares their use a public nuisance.

- Resolution # 2004-066 – July 20, 2004: This resolution acknowledges Trinity County's history of concerns about spraying herbicides and reaffirms its stance that herbicides are a public nuisance and that Trinity County is an herbicide-free zone.

Over the past 20 years, the lands adjacent to SR 299 and the Trinity River corridor have been subjected to substantial infestations of tree of heaven, scotch broom, and Himalayan blackberry. Several factors have influenced these infestations, including a lack of historical awareness of the need to manage these species and Trinity County guidance that strongly recommends against the application of herbicides within the county boundaries.

Jurisdictional Waters (Including Wetlands)

The U.S. Army Corps of Engineers (USACE) has regulatory authority over Navigable Waters of the United States pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Waters of the United States, including wetlands, pursuant to Section 404 of the Clean Water Act (CWA).

As described in section 4.3, the historic dredging activities that occurred in the area substantially modified the character and function of the wetlands along the Trinity River. An assessment of the geomorphic features at previous rehabilitation sites along the Trinity River suggests that prior to dredging activities the floodplain of the Trinity River was much larger than what has developed in association with the construction and operation of the TRD. Based on this assumption, jurisdictional waters (jurisdictional waters are waters under the jurisdiction of the USACE and consist of riverine and associated wetland habitats) likely declined following dam construction, in part because reduced flows inundate less of the floodplain. Fringe stands of fresh emergent vegetation, scrub-shrub, and forested wetlands now occur intermittently where a wider belt of wetlands likely existed under pre-dam conditions. The reduction in alternate point bars has also reduced post-dam wetland acreage by curtailing formation of side channels and other meander-related features.

Based on the delineation of jurisdictional waters at previously implemented habitat restoration sites along the Trinity River in the general vicinity of the Remaining Phase 1 and Phase 2 sites, jurisdictional waters, including wetlands are likely to occur within the boundaries of these sites. A wetland verification has been requested from the USACE and is anticipated by the end of May 2009. Features such as riparian wetland, fresh emergent wetland, seasonal wet meadow, seasonal wetland, and jurisdictional waters (i.e., other waters) could occur within project site boundaries. Other waters may include open water, riverine, intermittent stream and, ephemeral creek.

Wetlands

Wetland features likely to occur within the boundaries of the Remaining Phase 1 and Phase 2 sites are described below.

Riparian Wetlands. Riparian wetlands are often associated with the Trinity River corridor. Typical dominant plant species composition is similar to that described above for montane riparian habitat. The differences between montane riparian habitat (a plant community) and a riparian wetland (a jurisdictional type) include positive field indicators of wetland hydrology and hydric soils in riparian wetlands. Riparian wetlands are characterized by a complex of open to dense emergent herbaceous and woody riparian growth. Herbaceous plant species that almost always occur (> 99 percent probability) are designated as obligates (OBL) and herbaceous plant species that usually occur (> 67 percent probability) are designated as facultative wetland species (FACW). These plant species typically include torrent sedge (*Carex nudata* – FACW$^+$), tall flatsedge (*Cyperus eragrostis* – FACW), least spikerush (*Eleocharis acicularis* – OBL), smooth scouring rush (*Equisetum laevigatum* – FACW), and reed canary grass (*Phalaris arundinaceae* – OBL).

Fresh Emergent Wetlands. Fresh emergent wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. Vegetation, typically perennial, is present for most of the growing season in most years (Cowardin et al. 1979). In the project region, typical dominant plant species include narrow-leaf cattail (*Typha angustifolia* - OBL), Himalayan blackberry (FACW$^+$), perennial ryegrass (FAC), and narrow-leaved willow (OBL).

Seasonal Wet Meadow. Seasonal wet meadow occurs in areas where water does not appear to pond but nevertheless the soil saturates to the surface for sufficient duration to create a wetland habitat. Seasonal wet meadow is typically composed of herbaceous plant species that tolerate long-duration saturation.

Seasonal Wetland. In general, seasonal wetlands often occur in level or low-lying areas that exhibit positive field indicators of long-duration saturation during the growing season.

Other Waters

The following jurisdictional features are designated as "other waters" throughout this section of the document.

Intermittent Pool. Intermittent pools consist of shallow depressions that exhibit seasonal inundation. This jurisdictional type is a non-wetland water of the United States. It supports vegetation adapted to surviving in seasonally saturated and/or inundated conditions.

Riverine (Perennial Stream). The Trinity River is included within each proposed rehabilitation site and is the primary factor influencing wetland features associated with each site. Riverine habitat, identified as the river itself, exhibits a distinct bed and bank feature (i.e., scouring), as well as continuous inundation, watermarks, drift lines, and sediment deposits.

Intermittent Stream. Intermittent stream features include natural drainages that intermittently convey waters during the late fall, winter, and spring months, but are usually dry during the summer and early fall months. These features exhibit indicators of scouring and deposition of soil material. Upland plant species often colonize intermittent streams during the summer when no water is present. Water sources may include direct precipitation, runoff from upstream channel reaches, and seepage from surrounding soils (groundwater). Intermittent streams are non-wetland waters of the United States or "other waters."

Ephemeral Creek. Ephemeral creek features include natural drainages that convey water during and briefly after storms. Groundwater discharge does not constitute a portion of the flow. Ephemeral creeks are non-wetland waters of the United States or "other waters."

Vegetated Ditch. Vegetated ditches are excavated, linear features constructed to convey irrigation, road surface runoff, and/or water used for other human purposes. In the project region, typical species occurring in vegetated ditches include dense sedge (*Carex densa* – OBL), Mediterranean beardgrass (*Polypogon maritimus* – OBL), wild mint (*Mentha arvensis* – FACW), and annual hairgrass (*Deschampsia danthonioides* – FACW).

Non-Vegetated Ditch. Non-vegetated ditches generally consist of constructed drainage ditches that exhibit positive indicators for wetland hydrology and soils, but not vegetation.

Open Water. Open water features consist of a deep-water area that exhibits perennial inundation. This jurisdictional type is a non-wetland water of the United States or "other waters."

Other Biological Resources

Migratory birds and raptors (birds of prey) may nest within, or in close proximity to, the project sites. Migratory birds and their nests are protected under the federal Migratory Bird Treaty Act (MBTA; 50 CFR 10 and 21). Most of the birds found in the project area are protected under the MBTA. Raptors are also protected under the California Fish and Game Code. The communities in the project area provide suitable breeding and foraging habitat for several raptors, such as the red-tailed hawk and great horned owl.

Riparian habitat, which is considered a sensitive natural community by the CDFG, is present in the project area along the Trinity River.

Deer Critical Winter Range

Deer herds in most of California exhibited serious long-term declines during the late 1960s and early 1970s. In response, in 1976 CDFG developed a state-wide plan to address the problem, and in 1977 a Deer Management Policy was adopted by the Fish and Game Commission. CDFG has responsibility for writing and approving deer herd management plans, including designating Critical Winter Range. Critical Winter Range for the Weaverville deer herd occurs in the project area. Critical Winter Range is that portion of a winter range that deer are dependent upon during severe winter weather. Historically, construction of the Trinity and Lewiston dams inundated 17,000 acres of winter range for this herd (Trinity County 1987). As a result, the remaining winter range has been more heavily used, resulting in a reduction in its quality.

4.7.2 Environmental Impacts and Mitigation Measures

Significance criteria used to analyze the potential impacts of the project on vegetation, wildlife, and wetland resources include factual and scientific information and the regulatory standards of county, state, and federal agencies, including the CEQA Guidelines. These criteria have been developed to establish thresholds to determine the significance of impacts pursuant to CEQA (Section 15064.7) and should not be confused with a "take" or adverse effect under the ESA.

Impacts on vegetation would be significant if implementation of the project would result in any of the following:

- potential to substantially reduce the number or restrict the range of an endangered or threatened plant species or a plant species that is a candidate for state listing or proposed for federal listing as endangered or threatened;
- potential for substantial reductions in the habitat of any native plant species including those that are listed as endangered or threatened or are candidates or proposed for endangered or threatened status;
- potential for causing a native plant population to drop below self-sustaining levels;
- potential to eliminate a native plant community;
- substantial adverse effect, either directly or through habitat modifications, on any plant identified as a sensitive or special-status species in local or regional plans, policies, or regulations;

- substantial adverse effect on the quantity or quality of riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations;
- a conflict with any local policies or ordinances regarding protection or control of vegetation resources;
- a conflict with, or violation of, the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, state, or federal habitat conservation plan relating to the protection of plant resources; or
- an increased potential for spread of non-native and invasive plant species.

Impacts on wildlife would be significant if implementation of the project would result in any of the following:

- mortality of state or federally listed wildlife species, or species that are candidates for listing or proposed for listing;
- potential for reductions in the number, or restrictions of the range, of an endangered or threatened wildlife species or a wildlife species that is a candidate for state listing or proposed for federal listing as endangered or threatened;
- potential for substantial reductions in the habitat of any wildlife species, including those that are listed as endangered or threatened or are candidates or proposed for endangered or threatened status;
- potential for causing a wildlife population to drop below self-sustaining levels;
- substantially block or disrupt major terrestrial wildlife migration, or travel corridors;
- substantial adverse effect, either directly or through habitat modifications, on any wildlife species identified as a sensitive or special-status species in local or regional plans, policies, or regulations;
- substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations;
- a conflict with any state or local policies or ordinances protecting wildlife resources; or
- a conflict with, or violation of, the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, state, or federal habitat conservation plan relating to the protection of wildlife species.

Impacts on wetlands would be significant if they would result in any of the following:

- substantial adverse effect on any riparian habitat;

- substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA through direct removal, filling, hydrological interruption, or other means;
- a conflict with any state or local policies or ordinances protecting wetland and/or riparian resources; or
- a conflict with, or violation of, the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, state, or federal habitat conservation plan relating to the protection of wetland resources.

Impacts and Mitigation Measures

Table 4.7-3 summarizes the potential vegetation, wildlife, and wetlands impacts that would result from the No-Project Alternative, the Proposed Project, and Alternative 1.

Table 4.7-3. Summary of Vegetation, Wildlife, and Wetland Impacts for the No-Project Alternative, Proposed Project, and Alternative 1

No-Project Alternative	Proposed Project	Alternative 1	Proposed Project with Mitigation	Alternative 1 with Mitigation
Impact 4.7-1. Construction activities associated with the project could result in the loss of jurisdictional waters including wetlands.				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.7-2. Implementation of the project would result in the loss of upland plant communities.				
No impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]
Impact 4.7-3. Construction of the project could result in the loss of individuals of a special-status plant species.				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.7-4. Construction activities associated with the project could result in impacts to the state listed little willow flycatcher.				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.7-5. Construction activities associated with the project could result in impacts to foothill yellow-legged frogs.				
No impact	Significant	Significant	Less than significant	Less than significant

Table 4.7-3. Summary of Vegetation, Wildlife, and Wetland Impacts for the No-Project Alternative, Proposed Project, and Alternative 1

No-Project Alternative	Proposed Project	Alternative 1	Proposed Project with Mitigation	Alternative 1 with Mitigation
Impact 4.7-6. Construction activities associated with the project could result in impacts to western pond turtles.				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.7-7. Construction activities associated with the project could result in impacts to nesting Vaux's swifts, yellow warblers, and yellow-breasted chats.				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.7-8. Construction activities associated with the project could result in impacts to nesting bald eagles and northern goshawks.				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.7-9. Construction activities associated with the project could result in impacts to special-status bats and the ring-tailed cat.				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.7-10. Construction activities associated with the project could result in the temporary loss of non-breeding habitat for several special-status birds.				
No impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]
Impact 4.7-11. Construction activities associated with the project could result in impacts to BLM and USFS sensitive species.				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.7-12. Construction activities associated with the project could restrict terrestrial wildlife movement through the project area.				
No impact	Less than significant	Less than significant	Not applicable1	Not applicable1
Impact 4.7-13. Implementation of the project could result in the spread of non-native and invasive plant species.				
No impact	Significant	Significant	Less than significant	Less than significant

[1] Because this impact is less than significant, no mitigation is required.

Impact 4.7-1: Construction activities associated with the project could result in the loss of jurisdictional waters, including wetlands. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, no loss of jurisdictional waters would occur because the project would not be constructed.

Proposed Project

Floodplain values and functions would be enhanced by the Proposed Project in conjunction with ROD flows released by the TRD. Consequently, substantial non-riparian areas beyond those identified in pre-project plant community delineations are expected to convert to riparian habitats (in some cases, jurisdictional wetlands), both seasonal and perennial, within a 3-5 year post-project window. The TRRP would take advantage of opportunities during or after project construction to enhance wetland functions within the project boundaries or to create conditions required for functional jurisdictional wetlands (i.e., hydrology, vegetation, and hydric soils) to persist over time. For example, excavation of areas upslope (above the 6,000 cfs OHWM) to a depth coincident with medium- or low-flow (2,000–450 cfs) conditions may provide opportunities to establish the hydrologic conditions necessary for establishing functional jurisdictional wetlands.

Construction activities associated with the Proposed Project would result in temporary impacts to jurisdictional waters, including wetland features at one or more of the Remaining Phase 1 and Phase 2 sites. Temporary impacts to jurisdictional waters at any of these sites would be considered significant.

Alternative 1

Implementation of Alternative 1 would result in impacts similar to those described for the Proposed Project. Although, the maximum area of disturbance to jurisdictional waters would be smaller than under the Proposed Project, impacts would be considered significant.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

In order to avoid and minimize impacts to jurisdictional waters, the following mitigation measures will be implemented:

4.7-1a Prior to the start of construction activities, Reclamation will retain a qualified biologist to identify potential construction access routes to ensure that these features avoid and/or minimize to the fullest extent impacts to jurisdictional waters. In addition, Reclamation will clearly identify, and flag in the field, biologically sensitive areas (e.g., jurisdictional waters and riparian habitat) to be protected, and will provide the contractor with specific instructions to avoid any construction activity within these features. Reclamation will inspect and maintain marked areas on a regular basis throughout the construction phase.

4.7-1b Reclamation will continue to implement the Riparian Revegetation and Monitoring Plan during Proposed Project implementation. The plan acknowledges that the ultimate goals of the TRRP include enhancement and maintenance of functional riparian habitat and no net loss of riparian habitat and jurisdictional wetlands both within channel rehabilitation site boundaries and generally throughout the 40-mile reach of the Trinity River below the TRD.

4.7-1c Reclamation will initiate a 10-year mitigation monitoring program after the first growing season following project implementation. After a period of 3 years, the need for additional riparian habitat and wetland enhancement will be evaluated. At that time, Reclamation, in consultation with the USACE, Regional Water Board, and CDFG, will determine whether there is a need to further enhance or create additional areas of riparian habitat or jurisdictional wetlands within the project boundary so that there will be no net loss of wetlands at the end of a 5 year period and no net loss of riparian habitat after a 10-year monitoring period. In addition, wetlands will be re-delineated 5 years after project implementation to ensure no net loss of wetland habitat. Riparian habitat reporting 3 years after project implementation and wetland delineation 5 years after implementation will provide Reclamation with needed data in a timely fashion to take additional pro-active measures towards meeting the goals of no net loss of riparian habitat and jurisdictional wetlands within boundaries established for TRRP rehabilitation sites after 10 years.

Significance after Mitigation

Less than significant

Impact 4.7-2: Implementation of the project would result in the loss of upland plant communities. ***No impact for the No-Project Alternative; less-than-significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, no construction-related impacts to upland plant communities would occur because the project would not be constructed.

Proposed Project and Alternative 1

The Proposed Project and Alternative 1 would result in the temporary disturbance of upland plant communities. While the project activities would modify the contour and slope of upland areas, these areas would be subject to natural recruitment of native plants, supplemented by planting programs consistent with the TRRP vegetation management objectives. Over time, these upland areas would be revegetated to the degree that site conditions allow. A combination of replanting and natural revegetation would occur to ensure that riparian habitat values on the Trinity River meet wildlife needs. The need for revegetation would be determined via monitoring, coordination with local resource agencies, and adaptively managing to meet changing needs and desired future conditions. Temporary access routes and staging areas would be restored to their original condition upon completion of work. Additionally, any affected upland areas would be seeded with native plant species.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.7-3: Construction of the project could result in the loss of individuals of a special-status plant species. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, no construction-related impacts to a special-status plant species would occur because the project would not be constructed.

Proposed Project and Alternative 1

No federal or state listed plant species are expected to occur at the project sites. However, implementation of the Proposed Project or Alternative 1 could result in the removal of individuals or habitat for other special-status plant species (see Table 4.7-1). Because these species are considered special-status pursuant to CEQA, removal of individuals or habitat for these species could result in a potentially significant impact.

Mitigation Measures

No-Project Alternative

Since no significant impact was identified, no mitigation is required.

Proposed Project and Alternative 1

The following measures will be implemented to avoid or minimize project-related impacts to special-status plant species:

4.7-3a A qualified botanist will conduct a minimum of two pre-construction surveys to determine if special-status plant species occur within the project site. Surveys shall be conducted during the blooming periods of the plants potentially occurring at the site to determine (1) if the species occur and (2) the quality, location, and extent of any populations. If a special-status plants species is found within 250 feet of any proposed disturbance, the following measures will be implemented.

4.7-3b Prior to the start of disturbance, exclusionary fencing will be erected around the known occurrences. If necessary, a qualified botanist shall be present to assist with locating these special-status plant populations. The exclusionary fencing will be periodically inspected throughout each period of construction and be repaired as necessary.

4.7-3c If a population cannot be fully avoided, Reclamation will retain a qualified botanist to (1) determine appropriate salvage and relocation measures and (2) implement appropriate measures in coordination with CDFG staff.

Significance after Mitigation

Less than significant

Impact 4.7-4: Construction activities associated with the project could result in impacts to the state listed little willow flycatcher. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, no construction-related impacts to the little willow flycatcher would occur because the project would not be constructed.

Proposed Project

Suitable montane riparian habitat for the little willow flycatcher may be present at the Proposed Project sites, and the species has previously been detected in the region (Wilson 1995; Miller, Ralph, and Herrera 2003; Herrera 2006). Consequently, little willow flycatchers may nest at the Proposed Project sites. If montane riparian habitat is present, project activities (e.g., grading, vegetation removal) may result in a temporary reduction of foraging habitat for this species. However, implementation of Mitigation Measures 4.7-1a-c will ensure that there is no net loss of riparian habitat and a long-term increase in riparian habitat diversity. Due to the temporary nature of the impacts and the regional abundance of similar habitats, the project is not expected to have a significant impact on habitat for the little willow flycatcher. However, the removal of riparian vegetation and the noise associated with construction activities could disturb individuals nesting on or adjacent to the sites. Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Loss of fertile eggs or nesting little willow flycatchers or any activities resulting in nest abandonment would be considered a significant impact.

Alternative 1

Implementation of Alternative 1 would result in impacts similar to, but less than, those described for the Proposed Project because of the reduced amount of disturbance to montane riparian habitat.

Nevertheless, the potential impact to little willow flycatchers under Alternative 1 would be considered significant.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

The following mitigation measures will be implemented to avoid or minimize potential impacts to the little willow flycatcher:

4.7-4a Prior to the start of construction, a qualified biologist will conduct a survey of the project site(s) to determine whether suitable nesting habitat for the little willow flycatcher is present. If suitable habitat is present, Mitigation Measure 4.7-4b will be implemented.

4.7-4b Grading and other construction activities will be scheduled to avoid the nesting season to the extent possible. The nesting season for this species in Trinity County extends from June 1 through July 31. If construction occurs outside of the breeding season, no further mitigation is necessary. If the breeding season cannot be completely avoided, Mitigation Measures 4.7-4c and 4.7-4d will be implemented.

4.7-4c A qualified biologist will conduct a minimum of one pre-construction survey for the little willow flycatcher within the project sites and a 250-foot buffer around the sites. The survey will be conducted no more than 15 days prior to the initiation of construction in any given area. The pre-construction survey will be used to ensure that no nests of this species within or immediately adjacent to the project sites) would be disturbed during project implementation. If an active nest is found, CDFG will be contacted prior to the start of construction to determine the appropriate mitigation measures.

4.7-4d If vegetation is to be removed by the project and all necessary approvals have been obtained, potential nesting substrate (e.g., shrubs and trees) that will be removed by the project will be removed before the onset of the nesting season, if feasible. This will help preclude nesting and substantially decrease the likelihood of direct impacts.

Significance after Mitigation

Less than significant

Impact 4.7-5: Construction activities associated with the project could result in impacts to the foothill yellow-legged frog. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, no construction-related impacts to the foothill yellow-legged frog would occur.

Proposed Project

The foothill yellow-legged frog is known to occur in the Trinity River from the Lewiston Dam to the North Fork Trinity River (California Department of Fish and Game 2003). Thus, construction activities associated with the Proposed Project may affect foothill yellow-legged frogs directly and indirectly. Potential direct effects include mortality of individuals due to equipment and vehicle traffic, disturbance of boulders or cobbles that support egg masses, and the loss of riparian vegetation cover. The species may also be indirectly affected if construction activities result in degradation of aquatic habitat and water quality due to erosion and sedimentation, accidental fuel leaks, and spills. These impacts would be significant. Over the long term, the project would benefit the species through the creation of additional and higher quality habitat, such as feathered edges and backwaters that would provide habitat for early life-stages.

Alternative 1

Implementation of Alternative 1 would result in impacts similar to, but less than, those described for the Proposed Project because of the reduced disturbance to riverine and riparian habitats. Nevertheless, the potential impact to foothill yellow-legged frogs under Alternative 1 would be considered significant.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

In order to avoid and/or minimize impacts to the foothill yellow-legged frog, the following measures will be implemented:

4.7-5a If any construction in the Trinity River channel will occur prior to August 1 of any construction season, a pre-construction survey for yellow-legged frog larvae and/or eggs will be conducted by a qualified biologist. This survey will be conducted within the construction boundary no more than 2 weeks prior to the start of in-stream construction activities. If larvae or eggs are detected, the biologist will relocate them to a suitable location outside of the construction boundary.

4.7-5b In the event that a yellow-legged frog is observed within the construction boundary, the contractor will temporarily halt in-stream construction activities until the frog has been moved to a safe location with suitable habitat outside of the construction limits.

4.7-5c Mitigation measures presented in section 4.5 (Water Quality) for addressing erosion and sedimentation and accidental spills will be fully implemented to mitigate for potential indirect impacts to dispersal habitat for the yellow-legged frog due to sedimentation and accidental spills.

4.7-5d The mitigation measure associated with the disturbance to riparian habitat (Mitigation Measures 4.7-1a-c) will be fully implemented.

Significance after Mitigation

Less than significant

Impact 4.7-6: Construction activities associated with the project could result in impacts to the western pond turtle. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, no construction-related impacts to the western pond turtle would occur because the project would not be constructed.

Proposed Project

Riverine and riparian habitats along the Trinity River provide suitable habitat for the western pond turtle. Thus, construction activities associated with the Proposed Project and Alternative 1 could affect pond turtles directly and indirectly. Potential direct effects include mortality of individuals due to equipment and vehicle traffic, disturbance to nests in upland areas, and the loss of riparian cover. The species may also be indirectly affected if construction activities result in degradation of aquatic habitat and water quality due to erosion and sedimentation, accidental fuel leaks, and spills. These impacts would be significant. However, over the long term, the project would benefit the species through the creation of additional and higher quality habitat. For example, removal of riparian berms will improve access to potential upland nesting and overwintering sites, and the creation of side channels and alcoves with large woody debris would provide slow-water basking and foraging habitat.

Alternative 1

Implementation of Alternative 1 would result in impacts similar to, but less than, those described for the Proposed Project because of the reduced disturbance to riverine and riparian habitat. Nevertheless, the potential impact to western pond turtles under Alternative 1 would be considered significant.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

In order to avoid and/or minimize impacts to the western pond turtle, the following measures will be implemented:

4.7-6a A minimum of one survey for pond turtle nests will be conducted during the nesting season (generally late June-July) prior to construction. A qualified biologist will be retained by Reclamation to conduct the survey. If a pond turtle nest is found, the biologist will flag the site and determine whether construction activities can avoid affecting the nest. If the nest cannot be avoided, the nest will be excavated by the biologist and reburied at a suitable location outside of the construction limits.

4.7-6b Prior to construction in open water habitat, a qualified biologist will trap and move turtles out of the construction area to nearby suitable habitats.

4.7-6c During construction, in the event that a pond turtle is observed within the construction limits, the contractor will temporarily halt construction activities until the turtle has been moved to a safe location within suitable habitat outside of the construction limits.

4.7-6d Mitigation measures presented in section 4.5 (Water Quality) for addressing erosion and sedimentation and accidental spills will be fully implemented to mitigate for the potential indirect impacts to potential dispersal habitat due to sedimentation and accidental spills.

4.7-6e The mitigation measure associated with the disturbance to riparian habitat (Mitigation Measures 4.7-1a-c) will be fully implemented.

Significance after Mitigation

Less than significant

Impact 4.7-7: Construction activities associated with the project could result in impacts to nesting California yellow warblers, yellow-breasted chats, and Vaux's swifts. *No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.*

No-Project Alternative

Under the No-Project Alternative, no construction-related impacts to nesting yellow warblers, yellow-breasted chats, and Vaux's swifts would occur.

Proposed Project

The riparian community commonly found along the Trinity River in the project region provides suitable nesting and foraging habitat for the California yellow warbler and yellow-breasted chat. The conifer habitat in the region also provides habitat for the Vaux's swift. Consequently, project activities may result in impacts to these California Species of Special Concern.

The Proposed Project may result in a temporary reduction of foraging and/or roosting habitat for these species. However, implementation of Mitigation Measures 4.7-1a-c will ensure that there is no net loss of riparian habitat. Furthermore, project implementation would result in a long-term increase in riparian habitat diversity, increasing the quality of the habitat for the California yellow warbler and yellow-breasted chat. Due to the temporary nature of the impacts and the regional abundance of similar habitats, the project is not expected to have a significant impact on habitat for the California yellow warbler, yellow-breasted chat, or Vaux's swift. However, the removal of vegetation and the noise associated with construction activities could disturb individuals nesting on or adjacent to the sites. Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Loss of fertile eggs or nesting individuals or any activities resulting in nest abandonment would be a significant impact.

Alternative 1

Implementation of Alternative 1 would result in impacts similar to, but less than, those described for the Proposed Project because of the reduced disturbance to suitable habitat for these species. Nevertheless, the potential impact to California yellow warblers, yellow-breasted chats, and Vaux's swifts under Alternative 1 would be considered significant.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

In order to avoid and/or minimize impacts to nesting California yellow warblers, yellow-breasted chats, and Vaux's swifts, the following measures will be implemented:

4.7-7a Prior to the start of construction, a qualified biologist will conduct a survey of the project site(s) to determine whether suitable nesting habitat for the species is present. If suitable habitat is present, Mitigation Measure 4.7-7b will be implemented.

4.7-7b Grading and other construction activities will be scheduled to avoid the nesting season for these species to the extent possible. The nesting season for these species in Trinity County extends from March 15 through August. If construction occurs outside the breeding season, no further mitigation is necessary. If construction during the breeding season cannot be completely avoided, Mitigation Measures 4.7-7c and 4.7-7d will be implemented.

4.7-7c A qualified biologist will conduct a minimum of one preconstruction survey for these species within the project site(s) and a 250-foot buffer around the site. The survey will be conducted no more than 15 days prior to the initiation of construction in any given area. The preconstruction survey will be used to ensure that no nests of these species within or immediately adjacent to the project site(s) will be disturbed during project implementation. If an active nest is found, a qualified biologist will determine the extent of a construction-free buffer zone to be established around the nest.

4.7-7d If vegetation is to be removed by the project and all necessary approvals have been obtained, potential nesting habitat (e.g., shrubs and trees) that will be removed by the project will be removed before the onset of the nesting season, if feasible. This will help preclude nesting and substantially decrease the likelihood of direct impacts.

Significance after Mitigation

Less than significant

Impact 4.7-8: Construction activities associated with the project could result in impacts to nesting bald eagles and northern goshawks. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, no construction-related impacts to active bald eagle or northern goshawk nests would occur because the project would not be constructed.

Proposed Project

The hardwood and conifer communities commonly found along the Trinity River in the project region provide suitable nesting and foraging habitat for the bald eagle, designated by the State of California as endangered, and the northern goshawk, designated as a California Species of Special Concern.

The Proposed Project may result in a temporary reduction of foraging and/or roosting habitat for these species. However, due to the temporary nature of the impacts and the regional abundance of similar habitats, the project is not expected to have a significant impact on habitat for the bald eagle or northern goshawk. Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Loss of fertile eggs or nesting bald eagles or goshawks, or any activities resulting in nest abandonment, would be a significant impact.

Alternative 1

Implementation of Alternative 1 would result in impacts similar to, but less than, those described for the Proposed Project because of the reduced disturbance to suitable habitat for these species. Nevertheless, the potential impact to nesting bald eagles and northern goshawks under Alternative 1 would be considered significant.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

In order to avoid and/or minimize impacts to nesting bald eagles and northern goshawks, the following measures will be implemented:

4.7-8a Prior to the start of construction, a qualified biologist will conduct a survey of the project site(s) to determine whether suitable nesting habitat for the species is present. If suitable habitat is present, Mitigation Measure 4.7-8b will be implemented.

4.7-8b Construction will be scheduled to avoid the nesting season for bald eagles and northern goshawks to the extent feasible. The nesting season for most raptors in Trinity County extends from February 15 through July 31. Thus, if construction can be scheduled to occur between August 1 and February 14, the nesting season will be avoided and no impacts to nesting bald eagles and northern goshawks would be expected. If it is not possible to schedule construction during this time, the following mitigation measures will be implemented.

4.7-8c Pre-construction surveys for nesting northern goshawks will be conducted by a qualified biologist to ensure that no nests will be disturbed during project implementation. These surveys will be conducted no more than 14 days prior to the initiation of construction activities. During this survey, the biologist will inspect all trees immediately adjacent to the impact areas for bald eagle and northern goshawk nests. If an active nest is found within 500 feet of the construction area to be disturbed by these activities, the biologist, in consultation with the CDFG, will determine the extent of a construction-free buffer zone to be established around the nest.

4.7-8d If vegetation is to be removed as part of the project and all necessary approvals have been obtained, potential nesting habitat (i.e., trees) that will be removed by the project will be removed before the onset of the nesting season, if feasible. This will help preclude nesting and substantially decrease the likelihood of direct impacts.

Significance after Mitigation

Less than significant

Impact 4.7-9: Construction activities associated with the project could result in impacts to special-status bats and the ring-tailed cat. *No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.*

No-Project Alternative

Under the No-Project Alternative, no construction-related impacts to breeding special-status bats or the ring-tailed cat would occur because the project would not be constructed.

Proposed Project

The Trinity River riparian corridor provides suitable roosting and/or foraging habitat for four bat species: the long-eared myotis, pallid bat, Yuma myotis, and Townsend's western big-eared bat. Two of these bat species (long-eared myotis bat and pallid bat) may roost in trees (e.g., spaces under tree bark or in cavities) as well as caves and buildings, while the other two species (Townsend's western big-eared bat and Yuma myotis) prefer to nest in structures such as buildings, bridges, caves, and mines. For the long-eared myotis and pallid bat (species that roost in trees), habitat preference is typically woodland and forest habitat. It is unlikely that these bats would roost in the willows and alders typically found immediately along the Trinity River. However, they may roost in habitats more likely to contain large trees with cavities or loose bark, such as montane hardwood and foothill pine. In addition, suitable roosting habitat for the Townsend's western big-eared bat and Yuma myotis may be present at project sites encompassing or adjacent to bridges or mines.

Noise and visual disturbances associated with construction activities may disrupt bats roosting within and directly adjacent to the project area. Further, removing large trees with cavities could result in the direct loss of colonies, which would be considered a significant impact.

Each of these bat species has the potential to forage in the project area. Foraging habitat typically consists of forested habitats in close association with water. Construction activities associated with the Proposed Project could temporarily alter the foraging patterns of these species. However, this would be considered a less-than-significant impact based on the abundance of suitable foraging habitat in the region. No long-term adverse impacts to foraging habitat associated with project implementation are anticipated.

The Trinity River riparian corridor also provides habitat for the ring-tailed cat. The willows and alders typically found immediately along the river are unlikely to provide suitable denning habitat for this species due to the small size of the trees and lack of large cavities or snags. However, other habitats in the project area, such as montane hardwood and montane hardwood conifer habitats, may provide suitable denning sites. Thus, removal of large trees with cavities or snags could result in the loss of ring-tailed cats, which would be considered a significant impact. Construction activities would also result in a short-term reduction in foraging habitat for this species. However, the project would ultimately result in an increase in habitat and an increase in habitat quality for this species. Due to the abundance of similar habitat in the area, the temporary loss of foraging habitat would be a less-than-significant impact.

Alternative 1

Implementation of Alternative 1 would result in impacts similar to, but less than, those described for the Proposed Project because of the reduced disturbance to suitable habitat for these species. Nevertheless, the potential impact to special-status bats and the ring-tailed cat under Alternative 1 would be considered significant.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

In order to avoid and/or minimize impacts to roosting special-status bats and the ring-tailed cat, the following measures will be implemented:

4.7-9a A pre-construction survey for roosting bats and ring-tailed cats will be conducted prior to the start of construction activities. The survey will be conducted by a qualified biologist. No activities that would result in disturbance to active roosts of special-status bats or dens of ring-tailed cats will proceed prior to completion of the surveys. If no active roosts or dens are found, no further action is needed. Because bats are known to abandon young when disturbed, if a maternity roost is located, a qualified bat biologist will determine the extent of a construction-free zone to be implemented around the roost. If a bat maternity roost or hibernaculum is present, or a ring-tailed cat den is present, Mitigation Measures 4.7-9b and/or 4.7-9c will be implemented. CDFG will also be notified of any active bat nurseries within the disturbance zones.

4.7-9b If an active maternity roost or hibernaculum is found, the project will be redesigned to avoid the loss of the tree or structure occupied by the roost, if feasible. If the project cannot be redesigned to avoid removal of the structure, demolition of that structure will commence before bat maternity colonies form (i.e., prior to March 1) or after young are volant (flying) (i.e., after July 31). The disturbance-free buffer zones described above will be observed during the bat maternity roost season (March 1–July 31). If a non-breeding bat hibernaculum is found in a tree or structure to be razed, the individuals will be safely evicted under the direction of a qualified bat biologist, by opening the roosting area to allow air to flow through the cavity. Demolition will then follow no sooner than the following day (i.e., there will be no less than one night between initial disturbance for air flow and the demolition). This action will allow bats to leave during dark hours, thus increasing their chance of finding new roosts with a minimum of potential predation during daylight. Trees with roosts that need to be removed will first be disturbed at dusk, just prior to removal that same evening, to allow bats to escape during the darker hours.

4.7-9c If an active ring-tailed cat nest is found, the project will be redesigned to avoid the loss of the tree occupied by the nest if feasible. If the project cannot be redesigned to avoid removal of the occupied tree, demolition of that tree will commence outside of the breeding season (February 1 to August 30). If a non-breeding den is found in a tree scheduled to be removed, the individuals will be safely evicted under the direction of a qualified biologist. Trees with dens that need to be removed will first be disturbed at dusk, just prior to removal that same evening, to allow ring-tailed cats to escape during the darker hours.

Significance after Mitigation

Less than significant

Impact 4.7-10: Construction activities associated with the project could result in the temporary loss of non-breeding habitat for special-status birds. ***No impact for the No-Project Alternative; less-than-significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, no construction-related impacts to non-breeding habitat for sensitive species would occur because the project would not be constructed.

Proposed Project and Alternative 1

The Trinity River riparian corridor provides both foraging and perching habitat for golden eagles, American peregrine falcons, and black swifts, but suitable nesting habitat is absent. Construction activities associated with the project could temporarily alter the foraging patterns of these species; however, this impact would be considered less than significant based on the abundance of suitable foraging habitat in the vicinity of the Proposed Project. No long-term adverse impacts to foraging habitat associated with project implementation are anticipated. The loss of potential perch trees would not affect the abundance of these species or their use of the Trinity River for foraging habitat.

Mitigation

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.7-11: Construction activities associated with the project could result in impacts to BLM and USFS sensitive species. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1 except for the Pacific***

fisher, and less-than-significant impact for the Proposed Project and Alternative 1 for the Pacific fisher.

No-Project Alternative

Under the No-Project Alternative, no construction-related impacts to BLM or USFS sensitive species would occur because the project would not be constructed.

Proposed Project and Alternative 1

Several of the special-status wildlife species with potential to occur at the sites are designated as BLM or USFS sensitive species: foothill yellow-legged frog, western pond turtle, northern goshawk, little willow flycatcher, Pacific fisher, long-eared myotis bat, pallid bat, Townsend's western big-eared bat, and Yuma myotis bat (see Table 4.7-2). With the exception of the Pacific fisher, potential impacts to these species are discussed as separate impacts above. The Pacific fisher may use the Trinity River as a travel corridor; however, suitable denning habitat is not present at the sites. Therefore, the impact would be less than significant.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

Since no significant impacts for the Pacific fisher were identified, no mitigation is required. Mitigation Measures 4.7-4a-c will reduce impacts to the little willow flycatcher to a less-than-significant level. Mitigation Measures 4.7-5a-d will reduce the impacts to the foothill yellow-legged frog to a less-than-significant level. Mitigation Measures 4.7-6a-d will reduce the impacts to the western pond turtle to a less-than-significant level. Mitigation measures 4.7-8a-c will reduce the impacts to the northern goshawk to a less-than-significant level, and Mitigation Measures 4.7-9a-b will reduce the impacts to special-status bat species to a less-than-significant level.

Significance after Mitigation

Not applicable

Impact 4.7-12: Construction activities associated with the project could restrict the movement of terrestrial wildlife through the sites. ***No impact for the No-Project Alternative; less-than-significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, construction-related restriction of terrestrial wildlife movement through the sites would not occur because the project would not be constructed.

Proposed Project and Alternative 1

The Trinity River corridor provides habitat and travel corridors for such species as Pacific fisher, American marten, black-tailed deer, river otter, beaver, common merganser (*Mergus merganser*), green heron (*Butorides virescens*), black-crowned night heron (*Nycticorax nycticorax*), wood duck (*Aix sponsa*), belted kingfisher, cliff swallow (*Hirundo pyrrhonota*), bank swallow, and raccoon. The riparian vegetation along the Trinity River, in association with adjacent and/or nearby mixed-conifer and montane hardwood-conifer habitat, provides connected habitat within an area that has been fragmented by rural residential development and road building. Black-tailed deer inhabit shrublands, forests, and oak woodlands and use riparian vegetation for cover. Construction noise and activity will not significantly impede the seasonal migration of the Weaverville deer herd from high-elevation summer habitats to lower elevation critical winter ranges in the project vicinity. Construction noise could temporarily alter foraging patterns of resident wildlife species, and vegetation removal along the river could temporarily disrupt wildlife movement through the area. However, no long-term impediments to wildlife movement within the sites are anticipated as a result of implementing the Proposed Project or Alternative 1. Therefore, this would be a less-than-significant impact.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.7-13: Implementation of the project could result in the spread of non-native and invasive plant species. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, the spread of non-native and invasive plant species would not occur as a result of construction activities because the project would not be constructed.

Proposed Project and Alternative 1

Project implementation could result in the spread of non-native and invasive plant species (e.g., dalmatian toadflax, yellow star-thistle, Himalayan blackberry, and Klamathweed) during ground-disturbing activities. This would be considered a significant impact. However, further spread of weeds is not anticipated with implementation of the mitigation measures described below.

Mitigation Measures

No-Project Alternative

Since no significant impact was identified, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

In order to avoid and/or minimize the potential introduction and/or spread of noxious weeds, the following measures will be implemented:

4.7-13a When using imported erosion control materials (as opposed to rock and dirt berms), use only certified weed-free materials, mulch, and seed.

4.7-13b Preclude the use of rice straw in riparian areas.

4.7-13c Limit any import or export of fill to materials to those that are known to be weed free.

4.7-13d Ensure all construction equipment is thoroughly washed prior to entering the worksite. Equipment will be inspected to ensure that it is free of plant parts as well as soils, mud, or other debris that may carry weed seeds.

4.7-13e Use a mix of native grasses, forbs, and non-persistent non-native species for seeding disturbed areas that are subject to infestation by non-native and invasive plant species. Where appropriate, a heavy application of mulch will be used to discourage introduction of these species. Use of planting plugs of native grass species may also be used to accelerate occupation of disturbed sites and increase the likelihood of reestablishing a self-sustaining population of native plant species.

4.7-13f Within the first 3 to 5 years post-project, if it is determined that the project has caused non-native invasive vegetation to out-compete desired planted or native colonizing riparian vegetation, opportunities to control these non-native species will be considered. When implementing weed control techniques, the approach will consider using all available control methods known for a weed species.

Significance after Mitigation

Less than significant

SECTION 4.8

Recreation

4.8 Recreation

This section describes the recreation resources known to occur in the Trinity River basin in proximity to the proposed Remaining Phase 1 and Phase 2 rehabilitation sites along the Trinity River. It also evaluates potential impacts to recreation resources that could result from implementation of the Proposed Project and its alternatives, and the project's conformance with the federal and state Wild and Scenic Rivers Acts (WSRAs).

4.8.1 Environmental Setting

Regional Setting

Trinity County has a vast array of recreational resources including rivers, lakes, wilderness areas, and scenic byways. Major rivers in Trinity County are the Trinity River, South Fork Trinity River, North Fork Trinity River, New River, Mad River, Van Duzen River, and North Fork Eel River. These rivers offer recreational opportunities such as fishing, kayaking, rafting, recreational mining, and camping.

The Trinity River was designated as a National Wild and Scenic River in 1981 by the Secretary of the Interior. The designated reach extends from Lewiston Dam downstream to Weitchpec. Three tributaries to the Trinity River are also designated as Wild and Scenic: the New River, South Fork Trinity River, and North Fork Trinity River. The North Fork Trinity River is located at the downstream end of the 40-mile reach of the mainstem Trinity River discussed in this document (Figure 1-1).

The Trinity River Division (TRD) of the CVP includes two impoundments in Trinity County: Trinity Lake and Lewiston Lake. To varying degrees, these lakes provide recreational opportunities such as boating, fishing, and camping. Trinity Lake is situated in northeastern Trinity County and has a shoreline of about 120 miles, encompassing approximately 16,400 acres. It offers a wide variety of flat-water recreation opportunities, primarily during the summer. Lewiston Lake is immediately downstream of Trinity Dam and is operated as a re-regulation facility that discharges flows to the Trinity River and provides water to Whiskeytown Reservoir. The size and operational aspects of Lewiston Lake, coupled with cold water temperatures, limits recreational activities to non-contact activities such as boating, fishing and camping. A third impoundment, Grass Valley Creek Reservoir, is a small water body constructed to capture fine sediment in the upper Grass Valley Creek watershed. A prohibition on vehicular access limits recreational activities at this reservoir, primarily fishing, during certain times of the year.

There is one congressionally designated wilderness area in close proximity to the TRD. The Trinity Alps Wilderness provides recreational opportunities such as hiking, backpacking, horse packing, hunting, and angling. Located in the northern part of Trinity County, this wilderness area is the third largest in California and is a primary component of the Trinity River watershed.

Two scenic byways cross Trinity County: the Trinity Heritage Scenic Byway and the Trinity Scenic Byway. These byways provide scenic travel routes through Trinity County for residents and visitors. The Trinity Heritage Scenic Byway is along State Route (SR) 3. It begins in Weaverville and ends at

Yreka in Siskiyou County. This byway detours from SR 3 at several locations. Seven miles north of Weaverville it leaves SR 3 and turns east onto County Road 204, continuing for 9 miles to the town of Lewiston. The route provides opportunities for sightseeing in historic Lewiston and a side trip to the TRSSH. The byway then heads north on County Road 105 (Trinity Dam Boulevard) paralleling Lewiston Lake to Trinity Dam before rejoining SR 3 near Rush Creek Campground. It continues north on SR 3 to Guy Covington Drive and the historic Bowerman Barn. The Trinity Heritage Scenic Byway continues north, passing through the communities of Trinity Center, Carrville, and Coffee Creek. Ten miles north of Coffee Creek at the base of Scott Mountain the byway jogs northeast along Parks Creek Road and the upper Trinity River. The route continues another 40 miles from the Parks Creek Road before intersecting with I-5 in Yreka.

The federal government manages about 72 percent of the land in Trinity County. BLM is the primary land manager for public lands between Lewiston Dam and the confluence of the North Fork Trinity River, including lands in the corridor of the mainstem Trinity River. The Shasta-Trinity National Forest (STNF) manages the Trinity unit of the Whiskeytown Shasta-Trinity National Recreation Area (NRA), including the lands surrounding Trinity and Lewiston lakes as well as the reach of the Trinity River between the TRSSH and the confluence of Deadwood Creek. The STNF is the primary federal land manager between the confluence of the North Fork Trinity River and the mainstem Trinity River and the confluence of the New River and the Trinity River. The Six Rivers National Forest manages federal lands located between the New River and the Hoopa Valley Indian Reservation. The HVT manages lands within the Hoopa Valley Indian Reservation. The Yurok Tribe manages the reach of the Trinity River between Weitchpec (at the confluence of the Trinity the Klamath rivers) and the mouth of the Klamath River.

The Trinity River provides year-around recreation opportunities. These opportunities include boating, kayaking, canoeing, rafting, inner tubing, fishing, swimming, wading, camping, gold panning, nature study, picnicking, hiking, and sightseeing. Fishing for Chinook salmon, steelhead, and rainbow and brown trout are major recreational activities on the Trinity River throughout the year. With the development and implementation of the TRRP, the type, location, and timing of recreational activities continues to evolve.

Developed recreation areas along the Trinity River consist of private campgrounds, resorts, and lodges; public campgrounds and picnic areas; and fishing access sites. Approximately 35 developed recreation sites are located along the Trinity River corridor. Numerous river access sites occur between Lewiston Dam and Weitchpec. Expanded whitewater recreation opportunities created by TRRP post-ROD flows have significantly increased recreational use of the river.

Local Setting

There are a variety of residential subdivisions, commercial enterprises, and public facilities along the Trinity River corridor. Residential developments, commercial developments, and public facilities are scattered within and immediately adjacent to many of the Remaining Phase 1 and Phase 2 sites. River access and recreational development is concentrated around the communities of Lewiston, Douglas City, and Junction City. Table 4.8-1 provides a summary of the recreational developments that occur within, or in close proximity, to the Remaining Phase 1 and Phase 2 sites. Figure 4.8-1 illustrates the location of these developments relative to the sites.

Table 4.8-1. Recreational Development along the Trinity River

Developed Recreation	
Old Lewiston Bridge RV Resort	Privately owned facility that provides overnight accommodations (i.e., RV and tent camping), restrooms, laundry, phone, and recreation area as well as river access.
Old Lewiston Bridge River Access	CDFG-owned river access point.
Trinity River Resort and RV Park	Privately owned facility that provides overnight accommodations (RV and tent camping), restrooms, laundry, convenience store, phone, and recreation area as well as river access and boat launch ramp.
Rush Creek River Access	BLM-managed river access point that provides public restrooms and trash receptacles.
Bucktail Hole River Access	BLM river access point that provides public restrooms and trash receptacles.
Steel Bridge Campground and River Access Site	BLM-managed campsite that provides overnight and day-use facilities, river access sites, and a primitive boat launch site.
Indian Creek River Access	BLM managed river access point
Franks Trinity River Mobile Home and RV Park	Privately owned facility that provides overnight accommodations upstream of the RC site.
Trinity Island Resort	Privately owned facility that provides overnight accommodations (i.e., RV and tent camping).
Douglas City River Access	BLM-managed river access point that provides public restrooms and trash receptacles within the boundary of the Douglas City Campground.
Douglas City Campground	BLM-managed campsite that provides overnight and day-use facilities, river access sites, and a primitive boat launch site.
Steiner Flat Camping Area	BLM-managed campsite that offers primitive tent camping and river access.
Junction City Campground	BLM-managed campsite that provides overnight and day-use facilities, river access sites, and a primitive boat launch site.
Big Foot Campground	Privately owned facility that provides overnight accommodations, river access sites, and a primitive boat launch site.
Dispersed Recreation	
River access sites	There are numerous undeveloped river access sites located within the project boundaries. Situated on both private and public lands, these sites provide fishing access and primitive boat launch sites for rafts, canoes, kayaks, and other watercraft that can be carried to the Trinity River's edge.

4.8.2 Environmental Impacts and Mitigation Measures

Methodology

The analysis of the potential effect on recreation resources as a result of the Proposed Project or Alternative 1 consists of identifying recreational resources (e.g., parks and recreation facilities) in or near the boundaries of the rehabilitation sites and determining whether implementation of either action alternative would have an impact on these resources. This analysis is qualitative.

In addition to evaluating the impacts on recreational resources, an evaluation was made of the project's consistency with Trinity County recreation objectives and state and federal Wild and Scenic River designations. The WSRA Section 7 Determination for the Remaining Phase 1 and Phase 2 sites is included as Appendix B.

Significance Criteria

Impacts associated with recreational uses would be significant if the project would

- conflict with established or planned recreational uses within the project boundary;
- substantially affect existing recreational opportunities; or
- result in an increase in the use of the existing neighborhood, regional parks, public lands in general, or other recreational facilities such that substantial deterioration of these facilities would occur or be accelerated.

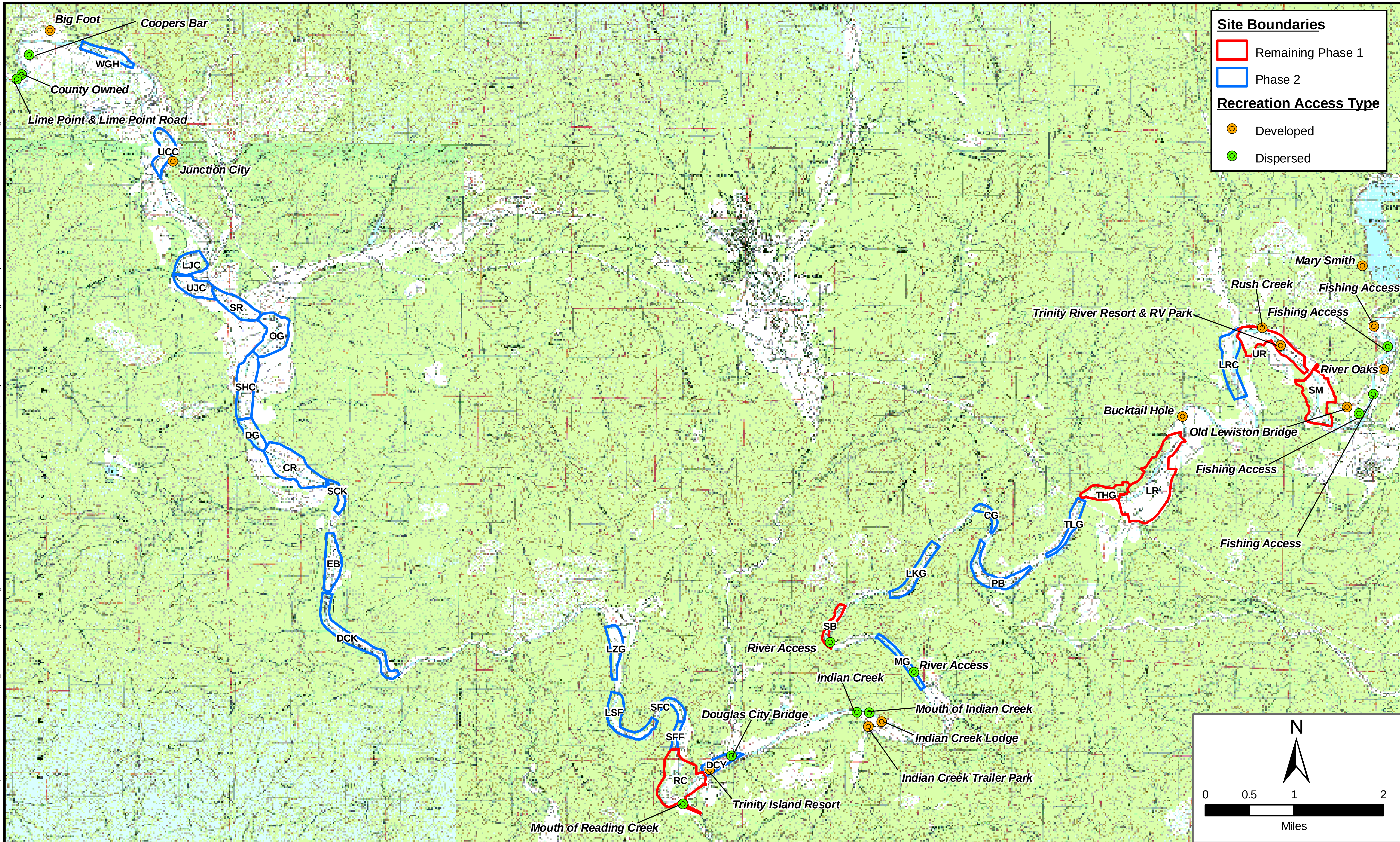
The following criteria were used to determine if project impacts to riverine recreation would be significant:

- a substantial increase in turbidity so as to negatively affect recreation aesthetics
- incompatibility with the federal or state Wild and Scenic River designation, which is defined as jeopardizing the river's scenic, recreational, or fish and wildlife resources
- non-compliance with Trinity County recreation resource objectives

Impacts and Mitigation Measures

Table 4.8-2 summarizes the potential impacts to recreation resources that could result from implementation of the Proposed Project or its alternatives.

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_4-8-1.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-16-08 Revised: 11-20-08 edouglas



North State Resources, Inc.

Trinity River Restoration Program: Remaining Phase 1 and Phase 2 Sites

Figure 4.8-1
Recreation Areas

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Table 4.8-2. Summary of Recreation Impacts for the No-Project Alternative, Proposed Project, and Alternative 1

No-Project Alternative	Proposed Project	Alternative 1	Proposed Project with Mitigation	Alternative 1 with Mitigation
Impact 4.8-1. Construction associated with the project could disrupt recreation activities, such as boating, fishing, and swimming, in the Trinity River.				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.8-2. Construction of the project could result in an increased safety risk to recreational users or resource damage to recreational lands within the project boundaries.				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.8-3. Construction activities associated with the project could lower the Trinity River's aesthetic value for recreationists by increasing its turbidity levels.				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.8-4. Implementation of the project could affect Wild and Scenic River values.				
No impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]

[1]Because this potential impact is less than significant, no mitigation is required.

Impact 4.8-1: Construction associated with the project could disrupt recreation activities, such as boating, fishing, and swimming, in the Trinity River. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, there would be no disruption of recreation activities such as boating, fishing, and swimming in the Trinity River because the project would not be constructed. Therefore, there would be no impact.

Proposed Project

As previously discussed, the Trinity River supports instream recreational uses, primarily whitewater recreation and fishing. Various instream recreational activities occur throughout the year, but are most prevalent between the months of April and February. Access to the Trinity River is available from both public and private lands, and ranges from undeveloped or primitive use areas to fully developed commercial resorts. Although public use is restricted at most private river access points, public agencies, including BLM, STNF, CDFG, and DWR offer a number of public river access points throughout the 40-mile reach. Public river access is not only used for a variety of water-based recreational activities, but for other activities as well, such as wildlife viewing and picnicking.

During implementation of the Proposed Project, there would be construction equipment and activity within the active river channel, the floodplain, and adjacent upland areas in close proximity to the Trinity River. Project activities at a majority of the rehabilitation sites would include vegetation removal and grading. Overall, treatments proposed within the activity areas described in Chapter 2 could result in temporary interruptions of public access and use in the immediate vicinity of the activity areas. However, river access would continue to be available at a number of locations within and adjacent to the project boundaries. After project implementation, access to river recreation opportunities would be substantially increased on public lands managed by federal, state, and local agencies.

Although potential disruptions to recreational activities within the project boundaries would be temporary, this impact would be significant.

Alternative 1

Alternative 1 would reduce the extent of rehabilitation activities proposed for any given project site in comparison to those associated with the Proposed Project. Although activities associated with Alternative 1 would be implemented to the degree necessary to accommodate post-ROD flows (e.g., by increasing channel sinuosity, thereby initiating a meander sequence appropriately scaled to ROD flows), the location, number, and magnitude of rehabilitation activities would decrease. Similar to the Proposed Project, Alternative 1 would have a significant, but temporary impact on recreational use; however, the extent of such an impact on a given rehabilitation site would be reduced.

Although potential disruptions to recreational activities within the project boundaries would be temporary, this impact would be significant.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

4.8-1a Reclamation shall provide precautionary signage to warn recreational users of the potential safety hazards associated with project construction activities. Signs and/or buoys shall be placed within and directly adjacent to the project boundaries along the Trinity River in accordance with the requirements specified in Title 14, Article 6 of the California Code of Regulations. Notification signs shall be posted at public river access areas located within the project area and managed by BLM, STNF, and DFG (e.g., Bucktail River Access, Steel Bridge Campground, Douglas City Campground, Indian Creek River Access, and Junction City Campground). Additionally, public notification of proposed project construction activities and associated safety hazards shall be circulated in the local *Trinity Journal* newspaper prior to the onset of project construction.

4.8-1b Reclamation will repair and/or replace any facilities associated with Remaining Phase 1 or Phase 2 sites that are impacted by project activities. This measure would include installation of interpretive signage consistent with the requirements of the STNF and BLM. Preconstruction meetings between Reclamation and landowners/land managers will identify the amount of vegetative screening to be retained at each recreation site within the project area.

Significance after Mitigation

Less than significant

Impact 4.8-2: **Construction of the project could result in an increased safety risk to recreational users or resource damage to recreational lands within the project boundaries.** ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, there would be no safety risks to recreational users or resource damage to recreational lands within the project boundaries because the project would not be constructed. Therefore, there would be no impact.

Proposed Project

During construction of the Proposed Project, there would be heavy equipment activity and construction vehicle traffic operating within, and immediately adjacent to, the low-flow (450 cfs) channel of the Trinity River. Activities associated with in-channel treatments would require work within the river channel for a short period (anticipated to be approximately 1-2 weeks per rehabilitation site). Low water river crossings proposed at some rehabilitation sites would be maintained for the duration of construction at that particular site. These crossings would consist of a gravel pad wide enough to accommodate construction equipment and vehicles moving from one side of the river to the other. Crossings would be constructed approximately 18 inches below the low flow water surface (under flows of approximately 300 to 600 cubic feet per second (cfs)) to allow enough freeboard for the safe passage of drift boats and rafts. Vehicular access to activity areas, including both uplands and in-channel, would be limited to authorized personnel. Upon completion of construction activities, the pad would be modified to prevent any further use as a vehicle crossing; fluctuations in river flows would serve to disperse the gravel downstream over time.

Although temporary, construction activities associated with the Proposed Project could pose a significant hazard to recreational users of the river and cause resource damage to recreational lands within the project boundary. Potential hazards to recreationists include the operation of construction equipment and vehicles in and around project sites, changes in the river’s subsurface movement as a result of the in-channel addition or removal of gravel, the addition of large woody debris into the channel, and an increased potential for a hazardous materials spill (e.g., diesel and hydraulic fluid) presented by construction equipment and vehicles operating in and adjacent to the river. Potential hazards to resources on recreational lands within the project boundaries include an increased potential for hazardous materials spills and unstable riverbanks and/or uplands resulting from excavation, material addition, road creation, and vegetation removal. These impacts would be temporary, but significant.

Post-construction, activity areas will be evaluated by Reclamation in conjunction with land managers and owners to identify specific prescriptions required to minimize any further potential safety risks to recreational users and to ensure the avoidance of any further project effects to resources occurring on recreational lands within the project boundaries.

Alternative 1

The potential effects of Alternative 1 on recreational users and resources occurring on recreational lands within the project boundaries are similar to those described under the Proposed Project. However, the reduced scope of activities proposed under Alternative 1, including the reduction in-channel crossings, decreases the potential safety hazard associated with the this alternative. Nevertheless, in-channel construction activities and the movement of construction equipment and vehicles throughout the project area during the construction of Alternative 1 would continue to pose a safety threat to recreational users. These impacts would be temporary, but significant.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

4.8-2 Implementation of Mitigation Measure 4.8-1a above would reduce this impact to less than significant.

Significance after Mitigation

Less than significant

Impact 4.8-3: Construction activities associated with the project could lower the Trinity River's aesthetic values for recreationists by increasing its turbidity levels. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, turbidity levels in the Trinity River would not increase because the project would not be constructed, therefore, there would be no impact.

Proposed Project and Alternative 1

Implementation of either the Proposed Project or Alternative 1 could increase turbidity in the Trinity River for some distance downstream. The level of this increase would largely be dependent on the flow regime at the time of the discharge. Flows that typically contribute to good fishing tend to be clear thus, nominal increases in turbidity may affect the recreational experience of anglers and the aesthetic values held by other user groups. Water quality objectives for the Trinity River specifically prohibit the discharge of any materials into the river that could cause a nuisance or adversely affects beneficial uses (e.g., recreation).

The Regional Water Board's Basin Plan (North Coast Regional Water Quality Control Board 2007) includes two specific prohibitions directed at construction, logging, and other associated non-point source activities:

- The discharge of soil, silt, bark, sawdust, or other organic and earthen material from any logging, construction, or associated activity of whatever nature into any stream or watercourse in the basin in quantities deleterious to fish, wildlife, or other beneficial uses is prohibited.

- The placing or disposal of soil, silt, bark, slash, or sawdust or other organic and earthen material from any logging, construction or associated activity of whatever nature at locations where such material could pass into any stream or watercourse in the basin in quantities deleterious to fish, wildlife, or other beneficial uses is prohibited.

Implementation of either the Proposed Project or Alternative 1 would increase the potential for turbidity and total suspended solids during construction activities. However, the Proposed Project involves substantially more in-channel work than Alternative 1, particularly the excavation of floodplain features and the requirement for numerous in-channel crossings. Fine sediments could be suspended in the river for several hours following in-channel activities. The extent of downstream sedimentation would be a function of the instream flow velocity and particle size. For example, fine-grained sediments like silts and clays could be carried several thousand feet downstream of the activity area, while larger-sized sediments like sands and gravels would tend to drop out of the water column within several feet of the construction limit. Increased turbidity and suspended solids levels would adversely affect water quality (refer to section 4.5, Water Quality) and could adversely affect anadromous fish species that are known to occur in the Trinity River (refer to section 4.6, Fisheries Resources), and could have a noticeable affect on the river's aesthetics. Increases in turbidity would be a significant impact.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

4.8-3a The water quality objective for turbidity levels in the Trinity River, as listed in the Basin Plan for the North Coast Region (North Coast Regional Water Quality Control Board 2007), is summarized below.

- Turbidity levels shall not be increased more than 20 percent above naturally occurring background levels. Allowable zones of dilution within which higher percentages can be tolerated may be defined for specific discharges upon the issuance of discharge permits or waiver thereof.
- Due to the nature of the proposed restoration activities and the clarity of the Trinity River during low flow conditions, the Regional Water Board has determined that an allowable zone of turbidity dilution is appropriate and necessary in order for Trinity River restoration activities to be accomplished in a meaningful, timely, and cost-effective manner that fully protects beneficial uses without resulting in a violation of the water quality objective for turbidity.
- Project activities that occur in areas outside of the active river channel will not increase turbidity levels by more than 20 percent above naturally occurring background levels. During in-river construction activities and until the first extended period of post-construction high flow (i.e., flows of at least 6,000 cfs inundate the project areas and floodplain for a minimum of 7 days) a zone of turbidity dilution within which higher percentages would be tolerated will be defined in discharge permits as the full width of the river channel within 500 linear feet downstream of any project activity that increases naturally occurring background levels, provided that all other required controls and appropriate BMPs for sediment and turbidity control are in place and downstream beneficial uses are also fully protected. When naturally occurring background levels are less than or equal to 20 NTUs, turbidity levels immediately downstream of the zone of turbidity dilution shall not exceed 20 NTUs. If naturally occurring background levels are greater than 20 NTUs, turbidity levels immediately downstream of the 500 linear foot zone of dilution shall not be increased by more than 20 percent above the naturally occurring background level.

4.8-3b To ensure that turbidity levels do not exceed the thresholds described above (4.8-3a) during in-river project construction activities, Reclamation shall monitor turbidity levels upstream within 50 feet of project activities (i.e., natural background) and 500 feet downstream of the in-river construction activities that could increase turbidity. At a minimum, field turbidity measurements shall be collected whenever a visible increase in turbidity is observed. Monitoring frequency shall be a minimum of every two hours during in-river work periods and when activities commence that are likely to increase turbidity levels above any previously monitored levels.

- If grab sample results indicate that turbidity levels exceed 20 NTU at 500 feet downstream from construction activities, remedial actions will be implemented to reduce and maintain turbidity at or below 20 NTU immediately downstream of the 500 linear foot zone of dilution. Potential remedial actions include halting or slowing construction activities and implementation of additional BMPs until turbidity levels are at or below 20 NTU.

4.8-3c Fill gravels used on the streambeds, stream banks, and river crossings will be composed of washed, spawning-sized gravels from a local Trinity River basin source. Gravel will be washed to remove any silts, sand, clay, and organic matter and will be free of contaminants such as petroleum products. Washed gravel will pass Caltrans cleanliness test #227 with a value of 85 or greater.

4.8-3d Reclamation will prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) that describes BMPs for the project, including silt fences, sediment filters, and routine monitoring to verify effectiveness. Proper implementation of erosion and sediment controls will be adequate to minimize sediment inputs into the Trinity River until vegetation regrowth occurs. All required controls and BMPs, including sediment and erosion control devices, will be inspected daily during the construction period to ensure that the devices are properly functioning. Excavated and stored materials will be kept in upland activity areas with erosion control properly installed and maintained. Excavated and stored materials will be staged in stable upland activity areas. All applicable erosion control standards will be required during stockpiling of materials.

4.8-3e To minimize the potential for increases in turbidity and suspended sediments entering the Trinity River as a result of access routes (e.g., roads), Reclamation will implement the following protocols:

- Keep bare soil to the minimum required by designs. Erosion control devices/measures will be applied to areas where vegetation has been removed to reduce short-term erosion prior to the start of the rainy season.
- Keep runoff from bare soil areas well dispersed. Dispersing runoff keeps sediment on-site and prevents sediment delivery to streams. Direct any concentrated runoff from bare soil areas into natural buffers of vegetation or areas with more gentle slopes where sediment can settle out.
- Disconnect and disperse flow paths, including roadside ditches, that might otherwise deliver fine sediment to stream channels.

- Decompact or rip floodplain areas so that surfaces are permeable and no surface water runoff occurs.

Significance after Mitigation

Less than significant

Impact 4.8-4: Implementation of the project could affect Wild and Scenic River values. ***No impact for the No-Project Alternative; less-than-significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, there would be no adverse impacts to Wild and Scenic River values because the project would not be constructed. Therefore, there would be no impact.

Proposed Project and Alternative 1

Construction and implementation of the Proposed Project or Alternative 1 would have a temporary effect on the scenic and recreational components of the Trinity River's Wild and Scenic River values. However, this temporary impact on scenic values would be less than significant because the rehabilitation activities would ultimately enhance the overall form and function of the Trinity River, thereby enhancing the outstandingly remarkable values for which it was designated a Wild and Scenic River. Temporary impacts on the scenic quality of the river are previously discussed under Impact 4.8-3 and in section 4.12 (Aesthetics).

The impact on Wild and Scenic River values would be less than significant because project activities would be temporary and would ultimately enhance the "natural" qualities of the river.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

SECTION 4.9

Socioeconomics, Population, and Housing

4.9 Socioeconomics, Population, and Housing

This section describes the regional and local socioeconomic conditions, population, and housing resources in the Trinity River basin and evaluates potential impacts to these resources from implementation of the Proposed Project and its alternatives. A detailed discussion of poverty rates and population by race and ethnicity is included in section 7.18, Environmental Justice.

Under CEQA, the "[e]conomic or social impacts of a project shall not be treated as significant impacts on the environment" (CEQA Guidelines Section 15131). Consequently, this section addresses CEQA issues only to the extent that potential social or economic impacts of the project either would have a direct impact or would result in reasonably foreseeable indirect impacts on the physical environment.

4.9.1 Environmental Setting

Regional Setting

Regional Labor Market

Trinity County is a rural region with substantial amounts of public land and a minimal private land base. As a result, the region is largely dependent on natural resources and recreation-based industries for its economic base.

Data concerning the labor force, employment, and unemployment were obtained from the California Employment Development Department (EDD), which estimates labor force and employment statistics for all counties in California, and the Center for Economic Development, which compiles data from local, state, and federal sources. Data for employment by industry was compiled by the Center for Economic Development, which used data from the U.S. Department of Commerce, Bureau of Economic Analysis (BEA) Regional Economic Information System (REIS). Differences in calculation methods and differences regarding what is considered employment may account for minor differences in EDD and REIS employment data (Center for Economic Development 2007).

Labor Force

Labor force refers to the total civilian labor force and is the number of non-institutionalized people age 16 and older who are working or looking for work and who are not in the military. Total labor force includes wage and salary workers, proprietors, and household workers. Annual average labor force is the 12-month average labor force for a given year. The average total labor force in Trinity County between the years of 1991 and 2006 was 5,250 people (California Employment Development Department 2008a; Center for Economic Development 2007). Annual variations have ranged from 4,850 people in 1999 to 5,420 people in 2003 (California Employment Development Department 2008a; Center for Economic Development 2007). The majority of Trinity County's labor force is concentrated in Weaverville and Hayfork. The primary communities within Trinity County are discussed in section 4.2, Land Use, and are shown on Figure 4.2-2.

Employment

Employment refers to total civilian employment as calculated by the EDD. Total civilian employment is the number of people employed in both the private sector and the non-military public sector. Employment includes wage and salary workers, proprietors, and household workers.

Trinity County employment rates fluctuated between 1990 and 2007. After a decline in the 1990s, employment rates rose in 2000 to 4,900 as a result of increased opportunities for tourism- and transportation-related job growth (California Employment Development Department 2008a; Center for Economic Development 2007). However, the current employment rate, 4,400, is the same as in 1990 (California Employment Development Department 2008a; Center for Economic Development). A decline in the timber industry and associated jobs accounted for some of this decline. Despite the closure of a mill in Hayfork, this community, along with Weaverville, continues to be one of the county's largest employment centers. Current unemployment rates are attributed to an economic recession.

Unemployment

Unemployment refers to the annual average civilian unemployment rate and represents the percentage of the total civilian labor force that is not employed. Trinity County's unemployment rate has been consistently higher than the California average. From 1990 to 2007, unemployment within the county was high, averaging 12.5 percent compared to the statewide average of 6.7 percent (California Employment Development Department 2008a, 2008b). However, the unemployment rate in Trinity County appears to be decreasing. Prior to 2000, the county's unemployment rate averaged 14.4 percent; however, since 2000, the average unemployment rate in the county fell to 10.2 percent (California Employment Development Department 2008a, 2008b).

The county's labor market depends on such factors as distance to SR 299 and distance to Weaverville, the county's business center and largest labor market. Ruth/Mad River, Hayfork, Zenia/Kettenpom, and Hyampom are rural communities that do not have ready access to SR 299 or Weaverville. Consequently, these communities have fewer job opportunities and a larger unemployment rate. In contrast, communities located on SR 299, such as Lewiston, Junction City, and Douglas City, from which Weaverville or Redding can be accessed directly, have lower unemployment rates.

Employment by Industry

In this section, industries are defined using the Standard Industrial Classification Manual, published by the Executive Office of the President, U.S. Office of Management and Budget (U.S. Office of Management and Budget 1987). The measurement of employment by industry is based on the type of industry and the annual average number of full-time and part-time jobs for a given industry in a particular year.

The industrial employment trend in Trinity County is a function of the county's ample recreational opportunities and tourism. Consequently, service industries, including hotels and lodging, recreation services, museums, auto repair, and engineering and management services, continue to experience growth. The industry with the highest earnings is government and public administration (Center for Economic Development 2007).

Income

Per Capita Income

Data compiled by the Center for Economic Development from the U.S. Bureau of the Census (Census) and the BEA show that per capita income levels in Trinity County tend to be significantly below state levels. Per capita income is the average income computed for every man, woman, and child in a particular group. The Census derives per capita income by dividing the total income of a particular group by the total population in that group (excluding patients or inmates in institutional quarters). Per capita income data for Trinity County and California are shown in Table 4.9-1.

Table 4.9-1. Per Capita Income, Trinity County and California

Year	Trinity County	California
1990	$14,248	$21,638
1991	$14,619	$21,750
1992	$15,443	$22,492
1993	$15,730	$22,635
1994	$15,784	$23,203
1995	$16,293	$24,161
1996	$17,001	$25,312
1997	$17,699	$26,490
1998	$18,276	$28,374
1999	$19,183	$29,828
2000	$19,930	$32,462
2001	$21,554	$32,883
2002	$21,827	$32,826
2003	$22,244	$33,554
2004	$23,710	$35,440
2005	$23,312	$37,462
2006	$24,318	$39,626

Source: Center for Economic Development (2007)

The data in Table 4.9-1, compiled by the Center for Economic Development using the U.S. Department of Commerce, Bureau of Economic Analysis database, show that while the per capita income of Trinity County and the state are both increasing, Trinity County continues to lag far behind the state, with its per capita income as much as 38 percent below that of the state in 2006.

Median Household Income

Median household income is the midpoint of the distribution of household incomes. Half of all households have incomes above this level, and half have incomes below this level. Median household income in Trinity County, though increasing, is lower than the state median household income. From 1999 to 2004, it increased by 16.5 percent, compared to the 26 percent increase in median household income for the state measured over the same period (Center for Economic Development 2007; U.S. Census Bureau 2008). Median household income in Trinity County continues to lag behind the state median by approximately 36 percent (based on 2005 data). This represents an average of $24,000 less available for each household in the county than for the state as a whole.

Regional Population

The population of Trinity County is generally characterized by stagnant growth, with higher proportions of white and retirement-age persons and lower proportions of Native American, Hispanic, and young working-age persons (Center for Economic Development 2007). The county's demographics are influenced by the fact that approximately 75 percent of its land is federally owned and 10 percent is in private industrial timber production, much of which is restricted from development by Timber Production Zone zoning (Trinity County 2003). Thus, only 15 percent of the county is private land usable for development purposes. The county's rugged terrain and remote location also influence its demographics by limiting the developable area. Education levels of residents are typical of most rural northern California counties, with a greater proportion of high school graduates and a smaller proportion of college graduates (Center for Economic Development 2007).

Total Population/Population Density

Population estimates are based on the number of people who were residing within the county boundaries, either permanently or temporarily, on January 1 of a given year. Total population includes foreign and domestic migrant workers. Trinity County's population continues to grow at a considerably lower rate than California on average, and was ranked by the U.S. Census Bureau as 54th in total population out of 58 California counties (U.S. Census Bureau 2008). Between 2000 and 2006, the county experienced a 9 percent increase in population compared to an estimated 8 percent increase in California's population during the same period (U.S. Census Bureau 2008). Declines in the timber industry and an attendant loss of jobs have had a significant effect on the county's population.

Trinity County has a population density well below the population density of California as a whole. The population density of the county in 2000 was estimated at 4.1 persons per square mile, while the population density of California was estimated at approximately 217 persons per square mile (Center for Economic Development 2007; U.S. Census Bureau 2008). Most of the population of Trinity County is concentrated in Weaverville, Hayfork, and Lewiston (Figure 4.9-1). The communities with the lowest population concentrations, Coffee Creek and Zenia/Kettenpom, are in some of the most remote areas of the county (Figure 4.9-1).

Housing

Each year, the California Department of Finance, Demographic Research Unit, estimates the number of housing units located in each county and incorporated entity, as well as in California as a whole. Housing units are estimated by adding new construction and units included in annexations and subtracting demolitions from the Census benchmark. The total number of housing units in Trinity County in 2006 is estimated at 8,251 (U.S. Census Bureau 2008). The total number of occupied housing units is estimated at 5,587 (U.S. Census Bureau 2008).

During the period of 2000 to 2007, there were 374 single family homes constructed in Trinity County; only two of these were multifamily units (California Employment Development Department 2008a).

Local Setting

The community of Lewiston offers only limited services, including several commercial enterprises, a U.S. Post Office, and Lewiston Elementary School. The community also has several recreation-based businesses within, or in close proximity to, the proposed rehabilitation sites, including the Trinity River Resort and RV Park, the Old Lewiston Bridge RV Resort, and the River Oaks Resort. These businesses provide economic benefits to the local community and the county, however, the Lewiston community is primarily residential. Existing land uses in the general vicinity of the rehabilitation sites are primarily rural residential or lands managed by federal or state agencies.

The community of Douglas City offers limited services, including several commercial enterprises, a U.S. Post Office, a water treatment plant, and Douglas City Elementary School. The community has several recreation-based businesses within, or in close proximity to, the proposed rehabilitation sites, including Douglas City Campground, Trinity Island Resort, Indian Creek Trailer and RV Park, Indian Creek Lodge, and Trinity River Outfitters. These businesses provide economic benefits to the local community and the county; however, the Douglas City community is primarily residential. Existing land uses in the general vicinity of the project sites are primarily rural residential or lands managed by federal or state agencies.

The community of Junction City offers limited services, including several commercial enterprises, a USFS work station, a U.S. Post Office, and Junction City Elementary School. This community has two commercial sand and gravel operations, as well as several recreation-based businesses, which include RV parks, lodges, and rafting and fishing guides that operate along the Trinity River between Lewiston and Big Bar. These businesses provide economic benefits to the local community and the county; however, the Junction City community is primarily residential.

Planned Developments in the Project Vicinity

There is little likelihood that parcels in the vicinity of the rehabilitation sites will be further subdivided because of their locations in the floodplain, zoning restrictions, soils conditions, and minimal county services (e.g., community water service). Zoning designations within the communities of Lewiston, Douglas City, and Junction City are largely residential, with minimum parcel sizes ranging from 1 to 40 acres (Trinity County 2003). Rural Residential zoning within these communities requires a minimum parcel size of 1 to 5 acres to retain the rural character of the area. Many of these parcels do not have access to community services, and rely on individual sewer and water services. In addition, portions of many parcels located directly adjacent to the river are designated as Flood Hazard and Open Space zones, restricting further development in these areas. Therefore, there is little potential for increased development densities in the project area.

Public lands in and adjacent to the rehabilitation sites are primarily managed for resource and recreation uses, and planned development would need to be consistent with resource and recreation goals and objectives of agency management plans.

4.9.2 Environmental Impacts and Mitigation Measures

Methodology

The following section provides a brief overview of the analytic methods used to assess the potential socioeconomic impacts of the Proposed Project and associated alternatives. These methods included qualitative assessments of potential impacts associated with employment, income, conflicts with county and local plans, population growth, displacement of persons and businesses, and community disruption. For the purpose of this assessment, Trinity County is considered to be the area of potential socioeconomic impact.

Income generation is one measure of economic activity in a community. Income growth spurs secondary economic impacts that ultimately result in increased employment activities. The duration of income growth, however, is an important consideration in determining the significance of an income change. Little increased long-term economic activity may result from short-term income growth unless such growth is substantial.

Significant increases in population concentration or growth can produce negative socioeconomic impacts, such as a lack of affordable housing, or can result in socioeconomic benefits, such as increased local revenues. The potential for the Proposed Project to result in an increase in population concentration or an increase in population growth has been qualitatively assessed.

The displacement of people (through loss of residences or places of employment) generally results in negative socioeconomic impacts, such as a decrease in the local work force and loss of employment opportunities, in addition to the direct impact to the people concerned. The potential of the Proposed Project to result in the displacement of people has been qualitatively assessed as a potential impact associated with the project.

Significance Criteria

For purposes of CEQA, under which "[e]conomic or social impacts of a project shall not be treated as significant impacts on the environment," project impacts on population and housing are relevant only if they either (i) directly relate to an impact on the physical environment, in which case a lead agency may, but need not, consider economic or social impacts in determining whether such physical impacts are significant, or (ii) would result in a reasonably foreseeable indirect impact on the physical environment

(See CEQA Guidelines, § 15131). Under CEQA, a Proposed Project would have a significant impact on population and housing if it

- induces substantial growth in an area, either directly or indirectly;
- displaces substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; and/or
- displaces substantial numbers of people, necessitating the construction of replacement housing elsewhere.

Impacts and Mitigation Measures

Table 4.9-2 summarizes the potential socioeconomic impacts resulting from construction and operation of the project.

Table 4.9-2. Summary of Socioeconomic Impacts for the No-Project Alternative, Proposed Project, and Alternative 1

No-Project Alternative	Proposed Project	Alternative 1	Proposed Project with Mitigation	Alternative 1 with Mitigation
4.9-1. Construction of the project would provide temporary employment opportunities for construction workers in Trinity County.				
No impact	Beneficial	Beneficial	Not applicable[1]	Not applicable[1]
4.9-2. Implementation of the project could result in the disruption or displacement of local businesses.				
No impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]
4.9-3. Implementation of the project would result in an increased demand for housing during construction.				
No impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]
4.9-4. Implementation of the project would result in concentrated population growth.				
No impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]

[1] Because this impact is less than significant, no mitigation is required.

Impact 4.9-1: Construction of the project would provide temporary employment opportunities for construction workers in Trinity County. ***No impact for No-Project Alternative; beneficial impact for Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, no employment opportunities would be created because the project would not occur. Therefore, there would be no impact.

Proposed Project and Alternative 1

Implementation of either the Proposed Project or Alternative 1 would generate temporary construction-related employment in Trinity County. The generation of employment results in social benefits, even if the employment is short-lived. The number of design, construction, and clerical positions required to complete the Proposed Project is undetermined, but it is expected to add a small percentage to existing local jobs annually for approximately 10 years. However, the duration of employment would be dependent on the length of the contracting and construction period (anticipated to be approximately 6 months per year). Alternative 1 would generate similar types of employment opportunities as the Proposed Project; however the duration and/or extent of these opportunities for Alternative 1 would be less due to the lower amount of construction activity.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.9-2: Implementation of the project could result in the disruption or displacement of local businesses. ***No impact for No-Project Alternative; less-than-significant impact for Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, no disruption or displacement of local businesses would take place because the project would not occur. Therefore, there would be no impact.

Proposed Project and Alternative 1

A few existing businesses are located within or directly adjacent to the sites associated with the Proposed Project or Alternative 1. However, local businesses in the vicinity of the rehabilitation sites would not be disrupted or displaced by either the Proposed Project or Alternative 1. Construction equipment and vehicle access would not impair access to these local businesses, and business operations would not be impaired. Businesses that operate on the river, such as rafting and fishing guides, would not be able to use certain river access points along the Trinity River during construction activity at specific sites; however, project construction would occur only at several rehabilitation sites annually, which would leave the majority of the river access sites available. This impact would be less than significant.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.9-3: Implementation of the project would result in an increased demand for housing during construction. ***No impact for No-Project Alternative; less-than-significant impact for Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, no increased demand for housing during construction would take place because the Proposed Project would not occur. Therefore, there would be no impact.

Proposed Project and Alternative 1

The area surrounding the communities of Lewiston, Douglas City, and Junction City is primarily a rural residential area. Few rental opportunities exist in these community plan areas. What rental property does occur in adjacent rural residential areas is typically seasonal rental property available for recreational pursuits. More readily available short-term apartment and single-family rentals are concentrated in the nearby community of Weaverville and, to a lesser degree, Hayfork.

Implementation of either the Proposed Project or Alternative 1 would not result in the displacement of any individual from his or her home. A short-term increase in the demand for housing in Weaverville could occur as a result of construction workers seeking lodging during the project staging and construction period (April through October). However, based on the estimated increase in annual employment generated by the project (approximately 20-30 individuals), this would be a less-than-significant impact, both regionally and locally. In addition to accommodating the short-term demands for housing for previous TRRP rehabilitation projects, the communities have been capable of meeting short-term increases in housing demands resulting from a large influx of fire suppression personnel on a recurring basis. This project would generate a much smaller demand for housing compared to that generated by personnel responding to wildland fires and would be a short-term impact. Therefore, the impact would be less than significant.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.9-4: Implementation of the project would result in concentrated population growth. ***No impact for No-Project Alternative; less-than-significant impact for Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, there would be no population increases during or after construction because the Proposed Project would not occur. Therefore, there would be no impact.

Proposed Project and Alternative 1

Implementation of either the Proposed Project or Alternative 1 would require about 20-30 individuals at any given rehabilitation site during construction. Any increase in population would likely occur seasonally on an annual basis. Based on current populations in the local communities, the projected number of workers that could move to the project area would result in a localized increase of less than 1 percent on a periodic basis. This amount would not constitute a significant concentration of population growth.

Workers could also be drawn from the local work force, which would further lessen population growth associated with project implementation. Overall, this impact would be less than significant.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

SECTION 4.10

Cultural Resources

4.10 Cultural Resources

This section describes the prehistory, ethnography, and history of the Trinity River basin in proximity to the proposed Remaining Phase 1 and Phase 2 sites along the River. The information contained in this section provides a general context for understanding the importance, origin, and types of cultural resources that are located within the boundaries of the Remaining Phase 1 and Phase 2 sites. Because neither the Proposed Project nor Alternative 1 would affect cultural resources outside of the Trinity River basin, the following discussion will address only those cultural resources associated with the Trinity River basin. Specific archaeological details of the Remaining Phase 1 sites are discussed in section 7.10.

4.10.1 Environmental Setting

Regional Archaeology and Ethnography

Five periods of prehistory have been described for California's northwest coastal region, which includes the Trinity River basin. These periods are the Paleo-Indian (10,000–6,000 B.C.), Lower Archaic (6,000–3,000 B.C.), Middle Archaic (3,000–1,000 B.C.), Upper Archaic (1,000 B.C.–A.D. 500), and Emergent (A.D. 500–1800). Periods are characterized by their "pattern," a term that refers to a culture's technology as revealed by the type and sophistication of its tools such as stone or bone projectile points used for hunting, warfare, or fishing; stone metates and manos used to grind seeds; and mortars and pestles used to grind acorns.

At the time of Euro-American contact the Chimariko, Hupa, Tsnungwe, Wintu, and Yurok Indian tribes inhabited the Trinity River region (to the Klamath River confluence) and the area inundated by the TRD facilities. The Wintu are thought to have been the primary inhabitants of lands encompassed by the Remaining Phase 1 and Phase 2 sites.

Chimariko

The Chimariko inhabited a 20-mile reach of the Trinity River extending from approximately Big Bar to the mainstem Trinity River's confluence with the South Fork Trinity River. The Chimariko lived in an area with abundant natural resources. The staples of their diet were salmon and acorns; but deer, elk, bear, pine nuts, seeds, berries, roots, and small mammals were also important food sources.

Little is known of the Chimariko social organization since their culture was destroyed at an early date. The information that remains indicates that the largest social unit was the village. Each village had a headman, which was a hereditary lifelong position passed through the male line. Status in Chimariko society was determined by wealth or a combination of wealth and birth. Only fragmentary data on Chimariko religion and myths exist. Although the Chimariko language no longer exists, it is thought to have been of Hokan stock.

Hupa

The Hupa inhabited the lower reaches of the Trinity River in the region surrounding its confluence with the Klamath River. The Hupa relied heavily on salmon, deer, and acorns as food sources, but also used other fish, nuts, seeds, mushrooms, roots, elk, and fowl.

As with many native groups of northwest California, the highest political entity was the village, but the Hupa had no formal chief or ruling council and were instead ruled by individuals having prestige. Each village had a leader or Headman. The political structure of the tribe beyond village involved ceremony and ceremonial leadership. The villages of the northern half of Hoopa Valley danced with Takimildin; the southern villages with Medildin. The village in the middle, Tsewenaldin, danced with either unless they were in dispute. At the time the Reservation was created, Captain John was Headman of Medildin, Senoxon Hostler was headman of Takimildin, and Tsewenaldin John was the Headman of Tsewenaldin Village

Prestige came from being acknowledged as someone who was trusted to care for the wealth of the family and the village. The headman held in name only the rights to the hunting, gathering, and fishing places of the village and it was his job to ensure that they were not used by others or over harvested by people of his village. He was responsible for the fish dam harvest and the division of the salmon among the people.

Ceremonial items (e.g., regalia, deerskins, and headdresses) handed down for generations and cared for by individuals (the regalia outlives you, you can't own it) has great value and is considered priceless (irreplaceable). Regalia belonged to a family or many families but were 'cared for' by one leader. The headman of the village had 'great wealth' but his wealth was the wealth of the village. If a settlement had to be paid to avert a war with another village, the Headman paid the settlement price.

The Hupa excelled at making bows and arrows, and their skills in basket making (twined basketry) are widely recognized.

The Hupas remained undisturbed until the 1850s, when the discovery of gold in the Trinity River basin attracted would-be miners into the area. In 1864, the Interior Department established the Hoopa Valley Reservation, centered near the confluence of the Trinity and Klamath rivers, followed by establishment of a boarding school in 1893. The community formed a business council in 1933, and that same year a public school was opened on the reservation.

Wintu

At the time of Euro-American contact most of the western side of the Sacramento Valley (north of Suisun Bay) was inhabited by Wintun-speaking people. Early in the anthropological study of the region, Powers had recognized a linguistic and cultural distinction between the southern membership of this large group (i.e., the Patwin) and the people occupying the northern half of the western valley (Powers 1976). Subsequent linguistic analyses resulted in the present division of Wintuan into a southern (Patwin) group, a central (Nomlaki) group, and a northern (Wintu) Wintuan stock. Clearly, however, the central and northern Wintus are very closely related and share numerous cultural traits and attributes.

The Wintu were divided into nine subgroups distributed from Cottonwood Creek in the south, northward through Shasta County and into portions of Trinity and Siskiyou counties, and westward into portions of southern Trinity and northern Tehama counties. Within the general vicinity of the project boundaries, the Wintu inhabited the Trinity River basin upstream of Junction City including the area inundated by the TRD.

Wintu subsistence was based on three main staples: deer, acorns, and salmon. All three of these food sources were abundant along the mainstem Trinity River and its primary tributaries, although acorns and deer were available only seasonally.

The available ethnographic information documents a complex pattern of land use, settlement, and subsistence. The salmon runs, the locations of seasonally available big game (especially deer), and the distribution of acorn-yielding oak trees made it necessary for the Wintu to periodically travel far from their home territory. Although these extended forays were often arduous, they allowed the Wintu an opportunity to collect raw materials such as obsidian and other utilitarian materials that could not be obtained near their home territory or through trade.

The contemporary Wintu community is relatively small in terms of the number of individuals. Currently, there is only one federally recognized group of Northern Wintu, located on the Redding Rancheria; but at least four additional Northern Wintu groups dispersed throughout Shasta and Trinity counties are in various stages of seeking federal recognition.

Yurok

The Yurok inhabited California's northwestern coastline from Little River to Damnation Creek, although their ancestral territory included the Klamath River corridor from the estuary upstream to Slate Creek near present-day Trinity Lake. Food sources included salmon, ocean fish, sturgeon, sea lion, whale, elk, deer, and duck, with acorns, berries, bulbs, and grass seed rounding out the traditional diet.

Yurok life is defined by extended families affiliated with villages and represented by head spokespersons. Ceremonial wealth and rights to subsistence resource areas determine familial standing within Yurok social structure. Yurok are recognized for their highly stylized art forms and their skills in making redwood canoes, weaving fine baskets, hunting, and, especially, riverine salmon fishing. Many ancient traditions are continued through contemporary times.

The Yurok Reservation, which occupies 63,035 acres centered along the Klamath River corridor, is the size of many cities or counties, but does not have the revenue base available to create sustainable economic development on the Reservation.

Regional and Local History

Trinity County was primarily shaped by three economic pursuits: ranching, logging, and mining. Early settlers during the 1840s farmed, logged, and milled lumber primarily to support their personal needs, though as the population increased, surplus products were transported and sold to new immigrants (Colby 1982; Cox 1958; Medin 1998). This lifestyle was disrupted by the discovery of gold in Trinity County in

1848. Mining on the Trinity River was a significant industrial operation that contributed to the economic development of Trinity County beginning in the 1890s and continuing to the 1960s (Bradley, 1941; Jones 1981; Medin 2007).

The region's first recorded European exploration occurred in 1845 when Major Pierson P. Reading encountered and named the Trinity River (the English translation of "Trinidad") when he mistakenly thought that the river emptied into the Pacific Ocean at Trinidad Bay. It is probable that fur traders like Jedediah Smith visited the region prior to 1845, although there is no written documentation available. Major Reading discovered gold near Douglas City on Reading Creek in 1848, the first discovery in Trinity County. The news of this discovery triggered a rush of miners and settlers to Trinity County between 1848 and 1850.

Boom towns quickly sprang up throughout the basin, with Weaverville and Trinity Center being among the largest, and nearly every flat and bar along the river was subsequently prospected. The community of Lewiston as shown in the area of potential effect (APE) was also founded as a mining settlement. With the influx of miners in the 1850s, other industries also flourished. Ranches were established along the Trinity River and its major tributaries, supplementing the family farms developed in the vicinity of Trinity Center, Lewiston and Junction City. Lumber mills were also an important local industry in the late 1800s because the mines used large quantities of lumber for flumes, shoring, housing, and general equipment (Colby 1982; Medin 1998). As the population in Trinity County grew, so did the need for food, services, and resources. In fact, there were more people living in the Trinity area in the 1850s than have ever inhabited the area at any one time since. In 1853, it was estimated that close to 2,000 Chinese alone lived and worked in Weaverville. This boom, however, was relatively short lived.

The locations of these early mining areas, homesteads, and their associated roads and trails, established the pattern of development for the towns and transportation routes that exists today. Many place names related to streams, gulches, and towns derive from early settlement and mining along the river. The community of Lewiston, for instance, was built on the old main trail from Shasta to Weaverville where Frank B. Lewis first built a trading post and started a ferry. After the discovery of gold in the 1840s, it became a sizeable mining community with a post office established in 1853 (Jones 1981:53,271,297). The community of Weaverville became a center of gold mining activity after 1849, and later the seat of Trinity County with a post office established in 1851. As mining operations became more organized (e.g., hydraulic and dredging), it was common practice to create small independent communities near these mines. Junction City was established by the Junction City Dredge Company, which built cottages to house employees and their families (Trinity County Historical Society 1974). Highway 299 follows much of the original route connecting Weaverville to Shasta, Redding, and Arcata as well as the smaller communities in between (Jones 1981:271).

One of the early surveyors of the area was William S. Lowden, who purchased 160 acres along the Trinity River west of Lewiston in 1852 near the APEs established for the Lowden Ranch and Trinity House Gulch sites. He became one of the most prominent settlers in the county as he not only maintained a productive ranch, but also worked as an express rider, surveyor, land attorney, and road builder. The Lowden family also pursued mining and logging activities and developed a stage stop and hotel. In 1855, he built a toll bridge across the river to connect existing pack trails and the first wagon road (Grass Valley or Buckhorn Road) into the county (Jones 1981).

Development of Placer Mining

The development of placer mining technology can be characterized as a progression of techniques that improved upon former methods to increase the volume of gravels that could be processed and the efficiency of mining gold. Improvements in technology required more capital investment. A few entrepreneurs formed companies to develop larger mines. Companies reinvested their profits, which were often not enough to develop a promising load. Speculators encouraged outside investment, usually from San Francisco, but by the 1870s, they were soliciting financial backing from the eastern United States and Europe (Kelley 1959; Medin 1998).

Early miners typically employed hand equipment, including pans, picks and shovels, cradles, sluice boxes, and various combinations thereof. The initial strategy focused on panning stream bed deposits. Gold became difficult to extract by the 1860s as the easily worked deposits along the Trinity River and its tributaries were played out. As the profitability of gold mining decreased by the 1870s, many miners sold their claims to become farmers, selling their meat and produce to miners, pack trains, stage companies, and local restaurants and hotels. The federal census data show that by 1870, only 15 percent of the work force was engaged in mining while 26 percent were farming (Elliot and Moore 1880; Medin 1998; Moore 1970). While many Euro-American miners abandoned their claims, Chinese miners and mining companies continued to mine (Kelly and McAleer 1986).

Ground sluicing became common in the 1850s as a way to access gold deposits in the stream channels and on the land above the river and creeks. By the 1860s, this technique was the dominate method of gold mining (Kelly and McAleer 1986). A ground sluice is a channel or trough in the ground, often hand dug to achieve the correct slope, through which gold bearing gravels are washed. Unlike the previous sluice box and cradle operations, ground sluicing required large quantities of water with which to excavate the ground. This need resulted in the construction of extensive networks of ditches, flumes, and penstocks. The intent was to reach bedrock, since deposits of placer gold are typically richest in the contact zone between the bedrock and overlying gravels.

Unpressurized water was directed via ditches over the margins of stream and river terraces to break down the sediments, which were then washed through a series of sluice structures. Hand tools and a steady stream of water was used to cave in and erode the ground into the prepared channel. The technique of ground sluicing for gold is characterized by a network of shallow ditches and deeper channels excavated into the upper river benches. A distinct “herringbone” pattern often marks the main drainage system of a ground sluice operation. The main trunk drain is intersected by several branch drains, which are flanked by rows of hand-piled rocks extending out at an angle from the main drain (Lindstrom 1988:53). Mining generally began at the base of the drains, closest to the river, and moved toward the water source or ditch (Lindstrom 1988; Kelly and MacAleer 1986). As excavation progressed, the ground sluicing channel in which active mining occurred became a drain, channeling water and tailings toward the river.

Gravels and soil were washed through a series of riffles and material collected from the riffles was subsequently processed through a board sluice or rocker, and eventually the pan. “Sluice forks” and shovels were used along the sluices to loosen and throw out larger cobbles and pebbles. The cobbles were vertically stacked along the edge of already worked ground, forming low walls that served as retaining walls to impound other cobbles and water diversion structures to facilitate cut bank erosion. As the use of ground sluicing expanded, check dams were constructed to impound water that could be released all at once to wash gravels through sluices with greater pressure, a technique call “booming” (Kelly and McAleer 1986; Lindstrom 1988; Medin 1998; Tibbetts 1997; Tordoff 1998; Wilson 1907). The practice of ground sluicing generally declined after about 1900. The method for ground sluicing was the antecedent to hydraulic mining (Kelly and McAleer 1986; Lindstrom 1988; Medin 1998; Ritchie 1981; Tibbetts 1997).

The advent of hydraulic mining was one of the major innovations for placer gold mining. Pressurized water directed by a hose and nozzle system, called a monitor or giant, was used to remove overburden and wash gold-bearing gravels through elaborate systems of sluice boxes. The hydraulic technology created a second boom because it allowed mining to expand to elevated alluvial deposits previously inaccessible due to their distance from water. It also created a small industry in Weaverville focused on manufacturing iron pipe for the mines. Hydraulic mining required greater investment capital and labor than previous mining efforts (Jones 1981; Medin 1998, 2007). Small groups of miners pooled their resources to construct ditches and holding ponds, and they conducted most of the hydraulic mines in Trinity County during the 1870s through the 1920s. Larger companies, exemplified by the La Grange Mine, consolidated many individual holdings with the assistance of outside investment to conduct hydraulic mining. The La Grange Mine, located between Weaverville and Junction City, became the largest placer gold hydraulic mine in California. The mine encompassed over 3,000 acres with 3,000 foot-long sluice boxes, and 27 miles of ditches and flumes. It had its own sawmill, ice plant, and electrical plant, and employed 30 men year-round (Medin 1998).

The nearest hydraulic mining activity to the APE is documented at the historic Paulsen Ranch near the confluence of Rush Creek and the Trinity River, in close proximity to the Sawmill and Upper Rush Creek sites (Trinity County Historical Society 1974:3). The Chamberlain and Red Hill Placer Mine began mining in 1859. Water was brought in from Rush Creek through 7 miles of ditch to one Number 4 monitor. The company operated for 7-month seasons each year “for many years” and averaged $7,000 in gold per year (O’Brien 1965). Reports of the California State Mining Bureau (1922a:207; 1923a:139) indicated that the “American-Italian Mining Company” was operating on Paulsen Ranch in 1923 with 8–10 men.

Hydraulic operations had profound effects upon the landscape throughout the Trinity River basin, leaving complex networks of ditches and canals, enormous excavations (e.g., cut banks, gullies and craters), and tremendous volumes of sediment that was delivered to channels throughout the basin. The peak of hydraulic mining lasted from the 1860s to the 1880s, when the nation’s first environmental lawsuits led to its strict regulation and eventual demise (Medin 2007:9-10). The millions of tons of silt, sand, and gravel that washed down from the mines were the industries undoing. The massive volume of debris that resulted from hydraulic mining clogged streams and rivers from the uplands all the way to the Pacific Ocean, obstructing navigable rivers and reducing their ability to carry flood waters. The lighter silt and sands spread over the river-side farms of the Sacramento Valley and ruined many farms. These downstream impacts of the industry eventually brought on a series of local, then federal, lawsuits, and a series of debates in the California Legislature on how (or if) the problem would be solved. The end of the debate came in 1884, when federal circuit judge Lorenzo Sawyer issued an injunction against all hydraulic mining in the state and ordered an immediate statewide halt to discharging tailings into rivers and streambeds (Kelley 1959).

With the Sawyer injunction, the industry collapsed and the hydraulic mines were abandoned. Over the next ten years, plans for local and regional dams to restrain mining debris were discussed and in 1893, legislation carried forward by Amador County Congressman Anthony Caminetti was signed. The Caminetti Act provided for the USACE to license the operation of individual hydraulic mines once they had demonstrated that their debris would not be discharged to the rivers. However, for most mines it was too late: their ditches and flumes had failed, capital for adequate debris dams was difficult to raise, and their workers had moved on. Sporadic operation of a few hydraulic mines continued into the 1960s (Kelley 1959).

The refinement of placer mining culminated with dredging. Dredges were utilized where large alluvial deposits existed adjacent to rivers, such as the Trinity. Dredge mining was more profitable and less financially risky than most types of mining because exploration methods, such as drilling test holes, had been developed to predict production levels (Medin 2007:9-10; Trinity County Historic Society 1974). Two types of dredges operated in the Trinity River basin and elsewhere in California: the bucket-line and the drag-line dredge.

Bucket-line dredges were in use in California by 1895. Early bucket-line dredges were relatively small, steam driven barges built on a wooden hull. The bucket-line dredge worked by means of an endless chain of buckets, linked one behind the other, rotating around a digging ladder (spud) that is raised and lowered as necessary. The series of buckets (or shovels) move in an endless chain around a solid arm, constantly bringing more and more material up the chain as it moves forward into new ground. The bucket delivers gravel to a hopper at the head of a screen that separates the larger gravel from the smaller material. The material too large to fall through the screen is carried via a mechanical stacker (a conveyor belt-like structure) or flume which moved the material far enough away from the stern of the boat that it would not interfere with dredging operations and allowed the dredge to stay afloat (Beckstead 2001). The tailings piles resulting from mechanical stacker-type dredges are a cluster of continuous arcs of cobble in longs rows, an effect created by the arc of the stacker as the dredge rotates on the spud, digging left, right, and center to clear a path for it to move forward and continue digging (Medin 2007; Trinity County Historic Society 1974; 2001:38). These tailing piles are evident at many locations adjacent to the Trinity River, and to a lesser degree, its tributaries.

One of the first of bucket-line dredges in Trinity County, the Poker Bar Dredge, began operation on the Trinity River after 1898 (Trinity County Historic Society 1974). Dredging operations were sporadic up to the turn of the century. This system for recovering gold was still fairly new and many operations were unsuccessful. Experimentation and refinement led to more effective gold recovery, and, by 1905, a more efficient system of revolving screens and shaking tables to separate gold from sand and gravels had been invented and used successfully. Dredge mining along the Trinity River boomed during the 1910s and 1920s as dredging became more efficient and a profitable business involving major investors, foreign and domestic (Medin 2007:10; Trinity County Historic Society 1974). With increased efficiency and capital investment, dredges were also built much larger. Such dredges include the Trinity, Gardella, and Gold Bar dredges, which reportedly mined in and adjacent to the APEs established for the Remaining Phase 1 sites.

Developed around the 1930s, drag-line dredges were a smaller type of dredge comprised of a standard drag-line shovel that travels over the ground under its own power, usually by means of caterpillar tracks. The bucket, with a capacity of 1–3 cubic yards, is suspended from a structural steel boom 50 feet or more in length. The gravel is washed in a separate unit whose equipment, the same equipment used on the bucket-line dredges, is on a barge floating in an adjacent pond (Holland 1942). These smaller dredges were more mobile and could access places that the larger bucket-line dredges could not go. Drag-line dredges were operated concurrently with bucket-line dredges along the Trinity River, probably by small scale entrepreneurs, up to about the 1940s. There is evidence of drag-line dredging within the APE established for the Lowden Ranch and Trinity House Gulch sites (Gold Bar). Records maintained by Trinity County indicate that the Poker Bar Placer Mining Company and the Lincoln Gold Dredging Company owned property on Gold Bar in the 1940s.

The hallmark of dredge mining is the tailings piles, which are still visible along the river. Each type of dredge deposited tailings in a different arrangement. Bucket-line dredges produced rounded, parallel rows of cobbles. Drag-line dredges produced conical or rounded piles of cobbles, either in clusters or individual piles, which are associated with a pond. The height of the tailings piles can be generally related to the size of the dredge. After the end of World War I in 1918, larger dredges, powered by electric motors were constructed. These powerful dredges were capable of stacking cobble to small boulder size material much higher than the smaller steam-powered dredges. Drag-line dredges were limited in size relative to the bucket-line dredges and their associated tailings deposits remained markedly smaller in height and proportion.

The comprehensive extent of dredge mining along the Trinity River is illustrated by the 15 minute series quadrangle maps, dated 1950 and 1951. Notations of "tailings" are located at almost every bar on the Trinity River from north of Lewiston downstream to Helena. Additional information regarding the history of mining in Trinity County may be found in a report developed by Reclamation, entitled *The Other California Gold: Trinity County Placer Mining, 1948-1962*, Report #07-NCAO-211, which is on file at the Bureau of Reclamation in Sacramento, California.

Present Environment

Regional Setting

The Trinity River basin remains a culturally significant area for several Native American tribes including the Hoopa Valley, Wintu, Yurok, and descendants of the now extinct Chimariko. Not only do these tribes have ties to this region that pre-date written history, but substantial numbers of modern-day tribal members continue to maintain many of the traditional uses of the area's natural resources, such as salmon fishing. However, retaining a culture in the wake of the historic mining activities, and more recently the TRD, that was traditionally and inextricably tied to the pre-European river ecology has resulted in conditions that are less than ideal for the continuation of some traditional practices. Changes to native land use practices brought about by the dam, current land uses, and increased population densities define a totally different kind of interaction between the native people and their environment.

A long history of flooding, fire, and vandalism have taken their toll on many potentially historically significant resources in the region. Few commercial mining operations remain and most current mining is recreational. A decline in the timber industry resulting primarily from changes in human values has had a significant effect on the regional economy. Mill closures and a decline in logging-related jobs have created a generally depressed economy in the region. However, some communities such as Weaverville have turned to their historic downtowns and rich mining history to develop a new economic base built on tourism.

Local Setting

Area of Potential Effect

Reclamation negotiated a Programmatic Agreement (PA) with the California State Historic Preservation Offices (SHPO) and the Advisory Council on Historic Preservation in November of 2000 (Appendix D) for Section 106 compliance regarding the Trinity River Main Stem Fishery Restoration Project. By design, the programmatic APE is general in nature and encompasses a larger area than the specific locations identified for rehabilitation in this document. The PA outlines how Reclamation conducts Section 106 compliance as well as provides direction on how to deal with resources identified within the programmatic APE. Specific locations for rehabilitation activities within the programmatic APE are delineated individually. An APE for each of these project specific locations is the subject of Section 106 compliance pursuant to the PA.

Archaeological and Historical Information Sources

A records search for the Trinity River-wide APE was conducted in support of the overall project, and additional records searches were conducted for the Remaining Phase 1 sites using the Northeast Center of the California Historical Resources Information System at Chico State University. Reclamation's records were also reviewed.

Native American Consultation

The Hoopa Valley Tribe (HVT) is a signatory of the PA and was a Co-Lead Agency in the preparation of the Trinity River Restoration Mainstem Fishery Restoration FEIS. This document acknowledges the role of the HVT and Yurok Tribe (YT) as cooperating agencies. In this capacity, these Tribes offer special expertise with respect to the issues addressed in this document (i.e., Fisheries, Wildlife, Tribal Trust, and Cultural Resources). The HVT and YT are represented on the TMC and have a long history working with agencies involved in restoring the fishery on the Trinity River. The HVT and YT were notified of the

NEPA/CEQA process pursuant to the 36 Code of Federal Regulations (CFR) Part 800 regulations. The Native American Heritage Commission previously identified two federally recognized tribes and four non-federally recognized Indian groups as possibly having cultural resource information applicable to the Remaining Phase 1 or Phase 2 sites.

4.10.2 Environmental Impacts and Mitigation Measures

Methodology

As a programmatic discussion, the APE for the cultural resource inventory and evaluation was established by Reclamation in accordance with the PA discussed in the previous section. This APE encompasses the entire 40-mile reach of the Trinity River below Lewiston Dam, including the rehabilitation sites described in this document. In conjunction with the requirements in the PA, Reclamation Archaeologists will conduct a record search and pedestrian surveys to ensure that any known cultural resources within the general vicinity of specific rehabilitation sites are addressed during the development of the Proposed Project. In some instances, this information has been used to adjust site boundaries and modify the location, type, and intensity of rehabilitation activities proposed within the project boundaries.

Significance Criteria/Determination of Effect

The activities within the rehabilitation sites were evaluated to determine how they might affect cultural resources. Impacts on cultural resources are considered significant if implementation of the proposed project would potentially disturb unique cultural resources or properties on, or eligible for, the National Register of Historic Places (NRHP).

For historical resources, the lead agencies have reviewed both the federal NHPA and CEQA in order to determine thresholds of significance. As noted above, CEQA provides that a project may cause a significant environmental effect if the project “may cause a substantial adverse change in the significance of an historical resource” (Public Resources Code, Section 21084.1). CEQA Guidelines Section 15064.5 defines a substantial adverse change in the significance of an historical resource to mean “physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired” (CEQA Guidelines, Section 15064.5, subd. (b)(1)). CEQA Guidelines Section 15064.5, subdivision (b)(2), states that the significance of a historical resource is materially impaired when a project

- demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the CRHR;

- demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to section 5020.1(k) of the Public Resources Code or its identification in a historical resources survey meeting the requirements of Section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or

- demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the CRHR as determined by a lead agency for purposes of CEQA.

With these definitions in mind, the lead agencies considered impacts on historical resources eligible for the NRHP or California Register of Historic Places (CRHR) to be significant if the project would alter their eligibility for the NRHP or CRHR by

- physically destroying or materially altering the characteristics of the historical resource that convey its historical significance and justify its eligibility for listing on the NRHP or CRHR;
- introducing visual, audible, or atmospheric elements out of character with the historical resource and its setting in such a way as to demolish or materially alter the characteristics that convey its historical significance and justify its eligibility for listing on the NRHP or CRHR;
- causing the historical resource to be subject to neglect to such a degree that the characteristics that convey its historical significance and justify its eligibility for listing on the NRHP or CRHR will be materially impaired; or
- resulting in the historical resource being transferred, leased, or sold, with the probability that the characteristics that convey its historical significance and justify its eligibility for listing on the NRHP or CRHR will be materially impaired.

In addition, based on CEQA Guidelines Section 15064.5 and Appendix G of the CEQA Guidelines, the Proposed Project or Alternative 1 would have significant effects if they would

- cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5;
- cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5;
- directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
- disturb any human remains, including those interred outside of formal cemeteries.

Impacts and Mitigation Measures

Table 4.10-1 summarizes the potential cultural resource impacts resulting from construction and operation of the project.

Table 4.10-1. Summary of Cultural Resources Impacts for the No-Project Alternative, the Proposed Project, and Alternative 1

No-Project Alternative	Proposed Project	Alternative 1	Proposed Project with Mitigation	Alternative 1 with Mitigation
Impact 4.10-1: Implementation of the project could cause a substantial adverse change in the significance of a known cultural resource.				
No impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]
Impact 4.10-2: Implementation of the project could potentially result in disturbance of undiscovered prehistoric or historic resources.				
No impact	Potentially significant	Potentially significant	Less than significant	Less than significant

[1] Because this impact is less than significant, no mitigation is required.

Impact 4.10-1: Implementation of the project could cause a substantial adverse change in the significance of a known cultural resource. ***No impact for No-Project Alternative; less-than-significant impact for Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, there would be no effects on cultural resources because the project would not be constructed.

Proposed Project and Alternative 1

Reclamation Archaeologists will evaluate any cultural resources within a specific rehabilitation site to determine if they are eligible for listing on the NRHP and subsequently determine if there will be adverse effects to historic properties, if present, pursuant to the PA. Any adverse impacts will be moderated by the conditions established in the PA following the criteria used to establish the boundaries and activities at the Remaining Phase 1 and Phase 2 sites. This impact would be less than significant.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impacts have been identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.10-2: Implementation of the project could potentially result in disturbance of undiscovered prehistoric or historic resources. ***No impact for No-Project Alternative; potentially significant impact for Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, there would be no effects on prehistoric or historic resources because the project would not be constructed. Therefore, there would be no impact.

Proposed Project and Alternative 1

Given the prehistory and history of the Trinity Basin, TRRP rehabilitation activities have the potential to affect unknown cultural resources that may be present in any one of the project sites. This impact would be potentially significant.

Mitigation Measures

No-Project Alternative

No impacts have been identified; therefore, no mitigation is required.

Proposed Project and Alternative 1

4.10-2a Prior to initiation of construction or ground-disturbing activities, all construction workers shall be alerted to the possibility of discovering cultural resources. This includes prehistoric and/or historic resources. Personnel shall be instructed that upon discovery of buried cultural resources, work within 50 feet of the find shall be halted and Reclamation's designated archaeologist shall be consulted. Once the find has been identified, Reclamation shall be responsible for developing a treatment plan for the cultural resource including an assessment of its historic properties and methods for avoiding any adverse effects, pursuant to the PA and in compliance with the NHPA.

4.10-2b If human remains are encountered during construction on non-federal lands, work in that area will be halted and the Trinity County Coroner's Office shall be immediately contacted. If the remains are determined to be of Native American origin, the Native American Heritage Commission (NAHC) shall be notified within 24 hours of determination, as required by Public Resources Code, Section 5097. The NAHC shall notify designated Most Likely Descendants, who will provide recommendations for the treatment of the remains within 24 hours. The NAHC will mediate any disputes regarding treatment of remains. If Native American human remains and associated items are discovered on federal lands, they will be treated according to provisions set forth in the Native American Protection and Repatriation Act (25 U.S.C. 3001) as well as Reclamation's Directives and Standards LND 02-01. If the find is determined to be a historical resource or a unique archaeological resource, as defined by CEQA, contingency funding and a time allotment sufficient to allow for implementation of avoidance measures or other appropriate mitigation shall be made available. Work may continue on other parts of the project while mitigation for historical or unique archaeological resources takes place.

Significance after Mitigation

Less than significant

SECTION 4.11

Air Quality

4.11 Air Quality

This section describes air quality standards and conditions in the project region, and evaluates air quality impacts associated with implementation of activities at the rehabilitation sites. Air emissions from project construction are measured against standards provided by the North Coast Unified Air Quality Management District (NCUAQMD).

4.11.1 Environmental Setting

Climate and Topography

According to the Soil Survey of Trinity County, California Weaverville Area (U.S. Department of Agriculture 1998), Trinity County has a climate characterized by hot, dry summers and cold, moderately wet winters. Local climate patterns are influenced by the varying topography of deeply dissected mountains and narrow river valleys. Most precipitation in the county results from major storms originating in the Pacific Ocean; however, short thunderstorms resulting from localized climate conditions occur in the summer months. The higher mountain ridges receive precipitation as snow and hold most of it until late spring. Precipitation in the lower elevations is dominantly rainfall, with occasional snow in the winter. Dense morning fog typically occurs in the valleys of the Trinity River basin during the winter and occasionally throughout the rest of the year (North Coast Unified Air Quality Management District 1995).

Trinity County has an average summer high temperature of 93.9 °F, and an average winter low temperature of 27.3 ºF. The average annual precipitation for Trinity County ranges from 30 inches at the lower elevations to 70 inches at the higher elevations. The climate along the 40-mile reach of the mainstem Trinity River below Lewiston Dam in the project vicinity is typical of other low elevations (1,400–2,000 feet) in Trinity County: mild, wet winters and hot, dry summers. Table 4.11-1 provides a summary of climate data recorded at the TRSSH Weather Station in Lewiston, California, which is approximately 7 river miles upstream of the SM site.

Table 4.11-1. Climatological Data For Trinity County (1974–2007)

Weather Parameter	Measurement
Average annual temperature	54.8 ºF
Average high temperature in January	47.9 ºF
Average low temperature in January	31.8 ºF
Average high temperature in July	92.5 ºF
Average low temperature in July	52.6 ºF
Highest recorded temperature	113 ºF
Lowest recorded temperature	4 ºF
Average annual precipitation	32.8 inches
Average days of precipitation per year	91 days
Average annual snowfall	6.5 inches
Highest recorded annual snowfall	29.9 inches

Source: Western Regional Climate Center 2008

Air Quality Standards

Federal Requirements

The 1977 federal Clean Air Act (CAA) requires the EPA to identify National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. NAAQS have been established for the following "criteria [1]" air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), suspended particulate matter (PM_{10} and $PM_{2.5}$), and lead (Pb).

Pursuant to the 1990 CAA amendments, the EPA has classified air basins (or portions thereof) as either "attainment" or "non-attainment" for each criteria air pollutant, based on whether or not the NAAQS have been achieved. Trinity County is part of the North Coast Air Basin, and is under the jurisdiction of the NCUAQMD (Figure 4.11-1).

State Requirements

Similar to federal requirements, the 1988 California Clean Air Act (CCAA) outlines a program to attain the California Ambient Air Quality Standards (CAAQS). The CAAQS are more stringent than the federal standards for the criteria air pollutants. Under the CCAA, areas in California have been designated as attainment or non-attainment with respect to the state ambient air quality standards. Trinity County is currently designated as non-attainment for the state standard for particulate matter less than 10 microns in diameter (PM_{10}).

When daily or annual pollutant levels are above the allowable state criteria, the area is considered to be in "non-attainment" for that particular pollutant; and that means the pollutant concentration exceeds public health and safety standards (North Coast Unified Air Quality Management District 1995). Table 4.11-2 summarizes both federal and state ambient standards for the criteria air pollutants.

Table 4.11-2. Federal and State Criteria Pollutant Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	State Standard
O_3	1-hour 8-hour	0.12 ppm 0.18 ppm	0.09 ppm —
CO	8-hour 1-hour	9 ppm 35 ppm	9 ppm 20 ppm
NO_2	Annual arithmetic mean	0.053 ppm	—
	1-hour	—	0.25 ppm
SO_2	Annual arithmetic mean	0.030 ppm	—
	24-hour	0.14 ppm	0.04 ppm

[1]Termed "criteria" pollutants because EPA publishes criteria documents to justify the choice of standards.

Table 4.11-2. Federal and State Criteria Pollutant Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	State Standard
	3-hour 1-hour	— —	— 0.25 ppm
Fine particulate matter (PM2.5)	24-hour	65 μg/m^3	65 μg/m^3
	Annual arithmetic mean	15 μg/m^3	12 μg/m^3
Respirable particulate matter (PM10)	24-hour	150 μg/m^3	50 μg/m^3
	Annual arithmetic mean	50 μg/m^3	20 μg/m^3
Pb	30-day average	—	1.5 μg/m^3
	Calendar quarter	1.5 μg/m^3	—

Notes: ppm = parts per million; μg/m^3 = micrograms per cubic meter
Source: California Air Resources Board 2008a

The California Air Resources Board (CARB), California's state air quality management agency, regulates mobile source emissions and oversees the activities of the NCUAQMD. The CARB regulates local air quality indirectly by establishing state ambient air quality standards and vehicle emission standards.

As of August 2007, CEQA lead agencies are required by law to analyze the potential of a Proposed Project to produce greenhouse gas (GHG) emissions, which consist primarily of carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4) (Public Resources Code Section 21083.05). This legislation also requires the Governor's Office of Planning and Research (OPR) to prepare and submit guidelines to the Resources Agency for the mitigation of GHG emissions and their effects by July 1, 2009. To date, OPR, local air boards, and local agencies have not developed specific GHG thresholds for use in determining the potential significance of project impacts. However, OPR released a Technical Advisory in June 2008 (California Office of Planning and Research 2008) that provides guidance for addressing CEQA GHG environmental impacts. In the absence of established standards, Lead Agencies have been directed by OPR to apply the technical guidance provided by the state. The recommended approach includes identifying GHG emissions generated by a project. In particular, "Lead agencies should make a good faith effort, based on available information, to calculate, model, or estimate the amount of CO_2 and other GHG emissions associated with vehicular traffic, energy consumption, water usage and construction activities" (California Office of Planning and Research 2008). The Technical Advisory recommends that Lead Agencies provide documentation of the available information and analysis used for significance determinations, and it recommends mitigation measures that may be appropriate.

The following GHGs are now regulated by the state: CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (Health and Safety Code 38505(g)). In an effort to reduce GHGs, the CARB has adopted vehicle emission standards to reduce GHGs that result from gas combustions (e.g., CO_2). Implementation of these new standards is set to become effective for vehicles manufactured in 2009; however, prior to enforcing the state law, the EPA must grant a waiver to the state

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Figure 4.11-1
California Air Basins

allowing stricter air quality standards than the CAA provides. The state has not yet obtained the necessary EPA approval. In addition to regulating GHG via vehicle emissions, the state's Climate Action Team, headed by CalEPA, set state-wide targets for reductions in CO_2 emissions. By 2020, the state aims to reduce current CO_2 emissions by 59 million tons.

Local Requirements

The North Coast Air Basin (NCAB) is comprised of five counties in northwest California: Del Norte, Humboldt, Trinity, Mendocino, and a portion of Sonoma County. Figure 4.11-1 illustrates the NCAB in relation to all air basins in California. NCUAQMD is responsible for monitoring and reporting air quality for three of these counties (i.e., Humboldt, Del Norte, and Trinity counties). The NCUAQMD, located in the far northwestern portion of California, encompasses approximately 7,134 square miles. Its western border is the Pacific Ocean, extending south from the Oregon border approximately 140 miles to the Mendocino County line. The basin varies in width from the coast, extending 30 to 100 miles inland.

The NCUAQMD has established air quality emission thresholds for stationary sources in the entire NCAB, which can be used to assess impacts to air quality in Trinity County. Air quality emission significance thresholds (the potential of a new or modified stationary source to emit air contaminants that would equal or exceed significant emission rates in tons per year) for stationary sources are presented in Table 4.11-3.

Table 4.11-3. Air Quality Emission Significance Thresholds, North Coast Unified Air Quality Management District

Air Contaminant	Significant Emission Rate (tons per year)
Carbon monoxide	100
Nitrogen oxides	40
Sulfur dioxide	40
Particulate matter	25
PM_{10}	16
Ozone	40 (as volatile organic compounds)
Lead	0.6
Asbestos	0.007
Beryllium	0.0004
Mercury	0.1
Vinyl chloride	1
Fluorides	3
Sulfuric acid mist	7
Hydrogen sulfide (H_2S)	10
Total reduced sulfur (including H_2S)	10
Reduced sulfur compounds (incl H_2S)	10

Source: North Coast Unified Air Quality Management District 2005

As part of its overall strategy to meet the state's health-based standard for PM_{10}, the NCUAQMD adopted a PM_{10} Attainment Plan (North Coast Unified Air Quality Management District 1995). Included in the plan are measures to reduce PM_{10} emissions from mobile sources, as well as from woodstoves and other combustion sources. The program funds reductions in nitrogen oxide (NO_x) emissions, PM_{10}, and toxic compounds contained in diesel exhaust.

Ambient Air Quality Conditions

The CARB maintains air quality monitoring sites throughout the NCAB that provide information on ambient concentrations of criteria air pollutants. The nearest monitoring station to the Remaining Phase 1 and Phase 2 sites is located at the Trinity County Courthouse, 101 Court Street in Weaverville, which is between the communities of Douglas City and Junction City.

Air quality measured at the Weaverville station may not be a precise representation of ambient air quality in the immediate vicinity of the project due to localized influences on air quality from the Trinity River corridor. However, this monitoring station does provide a good indication of air quality in the general vicinity.

Trinity County's air quality is generally good. The low population density, limited number of industrial and agricultural operations, and minimal traffic congestion problems contribute to the good air quality. The county is currently in attainment with all federal air quality standards and most state air quality standards; however, the county is in non-attainment for the state particulate matter (PM_{10}) standards.

Air quality in Trinity County is influenced by a number of factors, including stationary sources such as residential wood heating, non-stationary sources such as motor vehicle exhaust, forest management (i.e., prescribed fire), wildland fires, and the meteorology of a given area. The NCUAQMD has defined the following general source categories for air pollution (North Coast Unified Air Quality Management District 1995):

- industrial (e.g., sawmills, power plants, gravel plants, and other heavy industry);
- commercial (e.g., gas stations, body shops, restaurants, and dry cleaners);
- residential (e.g., home heating, backyard burning, and paint and solvent use);
- mobile (e.g., cars, planes, trains, and other transportation sources); and
- agricultural: forest management burning, field burning, herbicide use, etc.

Particulate Matter

Particulate matter consists of fine mineral, metal, soot, smoke, and dust particles suspended in the air. For health reasons, particulate matter that is less than 10 microns in diameter (PM_{10}) is monitored throughout the state. Trinity County identified the following pollutant sources as primary contributors to PM_{10}: wood stoves, wind-blown dust from dirt roads and agriculture, and open burning from backyard burn piles and prescribed forest fires. Wildland fires also result in increased levels of particulate matter. Some of these sources contribute to increases in local PM_{10} concentrations, while others, such as vehicle traffic and periodic wildland fires, have an impact on regional PM_{10} concentrations.

PM_{10} sampling showed that woodstove emissions during the winter months are the primary cause of high PM_{10} values in the NCUAQMD. PM_{10} sampling in Weaverville alone showed that, for samples over 50 $\mu g/m^3$, woodstove emissions contributed approximately 55 percent of PM_{10} measured (24-hour state standard) during high PM_{10} episodes, and approximately 30 percent on average of PM_{10} measured for all samples collected over a year (North Coast Unified Air Quality Management District 1995). High PM_{10} levels in Trinity County also correlate with wildland fire events.

Table 4.11-4 shows PM_{10} concentrations in Weaverville over a 10-year period. In 1999, PM_{10} concentrations (24-hour average) exceeded the state standards for more than 30 days. This relatively high PM_{10} level was attributed to an unusually large number of wildland fires in the vicinity of the Weaverville basin during the late summer months.

Table 4.11-4. PM_{10} Monitoring Data for Weaverville (1995–2007)

Criteria	Year	Estimated Days Over National Standard	Estimated Days Over State Standard	High 24-Hour Average	
				National	State
24-Hour Average	2007	0.0	3.9	51.2	51.8
	2006	—	—	160.6	153.9
	2005	—	—	32.3	32.4
	2004	—	—	42.4	42.5
	2003	—	—	56.5	53.9
	2002	—	—	52.3	52.5
	2001	0.0	—	72.6	72.0
	2000	0.0	6.6	50.8	51.1
	1999	0.0	35.8	99.6	94.9
	1998	0.0	0.0	46.2	46.5
	1997	0.0	17.8	54.0	54.0
	1996	0.0	—	72.0	63.0
	1995	0.0	—	41.0	—

Source: California Air Resources Board 2008a

Ozone

The NCUAQMD identifies O_3 as a concern in the NCAB. Ozone is an invisible pollutant formed when sunlight triggers chemical reactions between nitrogen oxides and hydrocarbons. The primary contributors to the formation of O_3 include vehicle emissions, industrial plant emissions, fossil fuel combustion, and evaporation of paints and solvents. However, O_3 levels in Trinity County are below the state and federal standards (California Air Resources Board 2005; North Coast Unified Air Quality Management District 2008).

Climate Change and Greenhouse Gases

Climate change refers to a significant change in measures of climate, such as average temperatures, precipitation, and wind patterns, over time. Significant changes in global climate patterns have recently been associated with global warming, an average increase in the temperature of the atmosphere near the Earth's surface, attributed to the accumulation of GHG emissions in the atmosphere. Generally speaking, these gases trap heat in the atmosphere, which in turn heats the surface of the Earth. Human activities that contribute GHGs include the combustion of fossil fuels (i.e., fuels containing carbon, such as wood, coal, gasoline, and diesel) (California Office of Planning and Research 2008).

The most common GHG that results from human activity is CO_2, followed by CH_4 and N_2O. According to the CalEPA Climate Action Team, transportation accounts for 38 percent of human caused GHGs in California, industrial activities account for 20 percent, electricity accounts for 23 percent, commercial and residential account for 9 percent, agriculture and forestry practice contribute 6 percent, and the remainder comes from other miscellaneous sources (California Environmental Protection Agency 2006). In 2004, fossil fuel combustion accounted for 98 percent of the carbon dioxide emissions in California, and measured 398 million metric tons. The CARB reports that California is the 15th largest source of climate change emissions in the world, exceeding most nations (California Air Resources Board 2008b). State efforts to minimize GHG emissions have not yet translated into monitoring for these gases in Trinity County.

Sensitive Receptors

A sensitive receptor is a location where human populations, particularly children, seniors, and sick individuals, are present and where there is a reasonable expectation of continuous human exposure to pollutants. The project is not located near a hospital or senior housing. However, portions of the project would be located near elementary schools, adjacent to residential areas, and adjacent to outdoor recreation areas.

Project activities that could generate fugitive dust and Toxic Air Contaminant (TAC) would be located approximately 300 feet from the Junction City Elementary School, less than a quarter mile from the Douglas City Elementary School, and about a half mile from the Lewiston Elementary School. Residential and recreational areas occur in and adjacent to Remaining Phase 1 and Phase 2 sites in Lewiston, Douglas City, and Junction City.

4.11.2 Environmental Impacts and Mitigation Measures

Methodology

Data for the impacts analysis were taken from the following reports on local and regional air quality: Particulate Matter Attainment Plan (North Coast Unified Air Quality Management District 1995), California Air quality data statistics (California Air Resources Board 2008a), North Coast Rules and Regulations (North Coast Unified Air Quality Management District 2005), and the Trinity County General Plan (Trinity County 2003). The air quality analysis is qualitative, and was conducted by assessing anticipated construction-related impacts of the project and comparing them to existing and anticipated future air quality conditions. The results are compared to local and national ambient air quality emissions and concentrations standards to determine the significance of the impacts.

Significance Criteria

According to Appendix G of the CEQA Guidelines, a project will normally have an adverse impact on air quality if it would

- violate any ambient air quality standard;
- contribute substantially to an existing or projected air quality violation;
- conflict with or obstruct implementation of any applicable air quality plan;
- result in a cumulatively considerable net increase of any criteria pollutant (e.g., PM_{10}) for which the region is in non-attainment under an applicable state ambient air quality standard;
- expose sensitive receptors to substantial pollutant concentrations;
- result in substantial air emissions or deterioration of air quality;
- create objectionable odors;
- alter air movement, moisture, or temperature, or result in any change in climate, either locally or regionally;
- produce toxic air contaminant emissions that exceed the air pollution control district’s threshold level for health risk; or
- result in a substantial increase or cumulatively considerable net increase in GHG emissions (e.g., CO_2).

Since the first two criteria include violation of either federal or state air quality standards, these criteria will also be used to determine significance for NEPA compliance.

The NCUAQMD has not formally adopted a CEQA threshold of significance for criteria pollutants such as CO, NO_x, PM_{10}, and SO_2, but does use the significant emission rates listed in Table 4.11-3 as a baseline when evaluating a project’s potential impacts to air quality.

Impacts and Mitigation Measures

Table 4.11-5 summarizes the potential air quality impacts resulting from implementation of the project.

Table 4.11-5. Summary of Potential Air Quality Impacts for the No-Project Alternative, Proposed Project, and Alternative 1

No-Project Alternative	Proposed Project	Alternative 1	Proposed Project with Mitigation	Alternative 1 with Mitigation
4.11-1. Construction activities associated with the project could result in an increase in fugitive dust and associated particulate matter (PM_{10} and $PM_{2.5}$) levels.				
No impact	Significant	Significant	Less than significant	Less than significant
4.11-2. Construction activities associated with the project could result in an increase in construction vehicle exhaust emissions.				
No impact	Significant	Significant	Less than significant	Less than significant
4.11-3. Construction activities and removal of vegetation associated with the project could result in vegetative materials that managers will decide to burn.				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.11-4. Construction and transportation activities associated with the project could result in an increase of greenhouse gas emissions and effects on climate change.				
No impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]
Impact 4.11-5. Construction activities would generate short-term and localized fugitive dust, gas, and diesel emissions and smoke that could affect adjacent residences and schools.				
No impact	Significant	Significant	Less than significant	Less than significant

[1]Because this potential impact is less than significant, no mitigation is required.

The potential for impacts on air quality from implementation of the project is discussed below.

Impact 4.11-1: Construction activities associated with the project could result in an increase in fugitive dust and associated particulate matter (PM_{10} and $PM_{2.5}$) levels. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, there would be no construction-related increase in fugitive dust and associated particulate matter levels because the project would not be constructed. Therefore, there would be no impact.

Proposed Project

Rehabilitation associated with the Proposed Project would require excavation, grading, disposal of earthen materials, and the use of heavy equipment and travel on unpaved roads, which would temporarily contribute fugitive dust in the project area. Fugitive dust emissions would also result from activities associated with vegetation removal and gravel injection. As discussed previously, these sources of fugitive dust are associated with PM_{10}, a criteria pollutant, for which the air basin is in non-attainment.

High levels of PM_{10} in Trinity County generally coincide with regional wildland fire events during the dry summer months, and with periods of cool, wet weather when localized woodstove use and brush burning activities contribute particulate matter to the air. Fugitive dust resulting from project activities would occur during the dry summer and early fall months, when PM_{10} levels may be elevated by wood stove use, brush burning, or wildland fires.

As described in Chapter 2, the project incorporates measures required by the NCUAQMD to minimize fugitive dust in and adjacent to the rehabilitation sites. These measures are summarized in section 2.6 Description of Construction Criteria and Methods.

Once rehabilitation activities cease at a specific site, the resulting impact on air quality would also cease. While the project design minimizes fugitive dust, project generated fugitive dust would be considered a significant impact because the air basin is in non-attainment status for particulate matter. The impact would be temporary (during rehabilitation).

Alternative 1

Alternative 1 would generate fugitive dust and particulate matter levels associated with project rehabilitation activities. However, Alternative 1 would generate less fugitive dust than the Proposed Project because it would implement significantly less channel rehabilitation measures and, therefore, would involve less earthwork, which translates to less fugitive dust. There would also be less vegetation removal under Alternative 1, which would decrease the amount of vegetation that could be burned. To the extent possible, revegetation would be coordinated with construction so that the amount of bare ground is limited. Revegetation would not commence until plants are dormant and fall wet conditions have returned. While the impact would be less under Alternative 1 than under the Proposed Project, it would nonetheless be significant because the air basin is in non-attainment for particulate matter.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

4.11-1a Reclamation will implement a dust control program to limit fugitive dust and particulate matter emissions. The dust control program will include the following elements as appropriate:

- Inactive construction areas will be watered as needed to ensure dust control.
- Pursuant to the California Vehicle Code (Section 23114), all trucks hauling soil or other loose material to and from the construction site will be covered or will maintain adequate freeboard to ensure retention of materials within the truck's bed (e.g., ensure 1–2 feet vertical distance between top of load and the trailer).
- Excavation activities and other soil-disturbing activities will be conducted in phases to reduce the amount of bare soil exposed at any one time. Mulching with weed-free materials will be used to minimize soil erosion, as described in section 4.3, Geology, Fluvial Geomorphology, and Soils, and section 4.5, Water Quality.
- Watering (using equipment and/or manually) will be conducted on all stockpiles, dirt/gravel roads, and exposed or disturbed soil surfaces, as necessary, to reduce airborne dust.
- All paved access roads, parking areas, and staging areas will be swept (with water sweepers), as required by Reclamation.
- Paved roads will be swept (with water sweepers) if visible soil material is carried onto adjacent private and public roads, as required by Reclamation.
- All ground-disturbing activities with the potential to generate dust will be suspended when winds exceed 20 mph, as directed by the NCUAQMD.
- Reclamation or its contractor will designate a person to monitor dust control and to order increased watering as necessary to prevent transport of dust offsite. This person will also respond to citizen complaints.

Significance after Mitigation

Less than significant

Impact 4.11-2: Construction activities associated with the project could result in an increase in construction vehicle exhaust emissions. *No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.*

No-Project Alternative

Under the No-Project Alternative, there would be no increase in construction vehicle exhaust emissions because the project would not be constructed. Therefore, there would be no impact.

Proposed Project and Alternative 1

Construction associated with either the Proposed Project or Alternative 1 would require the use of equipment that would temporarily contribute to air pollution in the Trinity River basin. Exhaust emissions from heavy equipment during construction could contribute to air pollution. Project construction activities would generate emissions from diesel- and gasoline-powered equipment and vehicles. Diesel particulate is an identified Hazardous Air Pollutant (HAP) and TAC, emissions of which should be minimized. In this regard, construction activities would require the contractor to comply with NCUAQMD Rule 104 (3.0) Particulate Matter or use portable internal combustion engines registered and certified under the state portable equipment regulation. Because diesel particulate matter is identified as a HAP and a TAC, and because these pollutants would be emitted as a result of project implementation, the Proposed Project would have a significant impact on air quality.

Construction vehicle exhaust emissions associated with Alternative 1 would be less than under the Proposed Project because there would be less construction associated with channel rehabilitation and, therefore, less vehicle exhaust resulting from construction work and transportation. However, even though there would be fewer hours of construction equipment operation associated with Alternative 1, it would have a significant impact on air quality.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

4.11-2a Reclamation will comply with NCUAQMD Rule 104 (3.0) Particulate Matter. This compliance could occur by using portable internal combustion engines registered and certified under the state portable equipment regulation (Health & Safety Code 41750 through 41755).

Significance after Mitigation

Less than significant

Impact 4.11-3: Construction activities and removal of vegetation associated with the project could result in vegetative materials that managers will decide to burn. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, there would be no vegetative materials that would need to be burned because the project would not be constructed. Therefore, there would be no impact.

Proposed Project and Alternative 1

Implementation of either the Proposed Project or Alternative 1 would include vegetation removal resulting in vegetative material that would be buried, piled to create wildlife habitat, chipped, or burned. Piling and burning is a quick and economical way to eliminate flammable biomass and reduce concentrations of wildland fuels. Brush piles set aside for burning would be left intact until site construction is finished, and subsequently burned under the direction of Reclamation, consistent with USFS, BLM, and Cal Fire requirements. Burning vegetation in the fall/winter period (November–April) would eliminate effects to nesting birds. In the event that piles are burned, smoke would temporarily contribute to air pollution in the Trinity River basin. Burning vegetation would contribute particulate matter to the air, a criteria pollutant for which the basin in is non-attainment. Therefore, the impact would be significant.

Implementation of Alternative 1 would result in less vegetative debris, and could result in less vegetative burning than the Proposed Project. Nonetheless, Alternative 1 activities associated with burning vegetation would be significant. Burning vegetation would contribute particulate matter to the air, a criteria pollutant for which the basin in is non-attainment.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

4.11-3a Vegetative piles to be burned will consist only of dried vegetative materials. Burn piles will be no larger than 10 feet in diameter. Field personnel will be on site during all hours of burning, and materials necessary to extinguish fires will be available at all times.

4.11-3b In general, all requirements of a NCUAQMD "NON-Standard" burn permit will be met for burning. Burn management planning will include but not be limited to the following:

- Ensure that burning occurs only on approved burn days as defined by the NCUAQMD (determined by calling 1-866-BURN-DAY).
- Burning will only occur during suitable conditions to ensure control of ignited fires. For instance, water to wet the litter and duff layer and penetrate the mineral soil layer to 1/4 inch or more will be present, wind speeds will be low (<10 mph), and temperature will be low (<80 ºF).
- Piles will be covered with a 5-foot x 5-foot sheet of 4-mil polyethylene plastic to promote drying of the slash. At least 3/4 of each pile surface will be covered and the plastic

anchored to preserve a dry ignition point. Dry fuel conditions will minimize smoke emissions.

- Slash piles will not be constructed on logs, stumps, or talus slopes within 25 feet of wildlife trees with nest structures, in roadways, or in drainage ditches. Piles will not be placed within 10 feet of trees intended to be saved (reserved trees) or within 25 feet of a unit boundary.

4.11-3c Reclamation will notify the public each day that burning is to occur. Signs or personnel will notify residents and traffic on nearby access routes.

Significance after Mitigation

Less than significant

Impact 4.11-4: Construction and transportation activities associated with the project could result in an increase of greenhouse gas emissions and effects on climate change. ***No impact for the No-Project Alternative; less-than-significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, there would be no construction or transportation activities because the project would not be implemented. There would be no increase in GHG emissions that would contribute to global climate change.

Proposed Project and Alternative 1

Transportation and construction activity associated with project implementation would generate GHG emissions from diesel- and gasoline-powered vehicles and equipment. Burning vegetation would also emit CO_2, which is a GHG. A number of measures are identified in Chapter 2 that are intended to reduce the impacts relative to climate and GHGs. These measures are incorporated into the Proposed Project and Alternative 1. Additionally, the following measures will be used to enhance the awareness of global warming in conjunction with either action alternative:

- Provide project contractors with educational material about fuel efficiency and incentives;
- Promote incentives for contractors to initiate ride-sharing programs;
- Promote the use of energy efficient and alternative fuel construction equipment and transportation fleets through contract incentives;
- Require contractors to provide recycling bins for on-site waste materials;
- Provide incentives for contractors to use re-usable water containers rather then plastic bottled water;

- Provide incentives for contractors to hire locally;
- Require re-useable batteries for equipment that can use them.

As discussed above, emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the combustion of fossil fuels. Use of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2004, accounting for 38 percent of the total GHG emissions in the state. A byproduct of fossil fuel combustion is CO_2.

In order to determine the significance of the impact, a "carbon foot-print" was estimated based on the Proposed Project's generation of GHGs (primarily CO_2). Project activities that would offset potential impacts were weighed into the equation. The following quantities of combustible fuel and vegetation disturbance were used to determine the carbon footprint for the Proposed Project: an average of 285 gallons/day of diesel fuel would be used by construction equipment[2] and an average of 35 acres of vegetation could be removed per site[3]. It would take approximately 676 days to complete construction activities for the Proposed Project.[4]

Based on these estimates, the Proposed Project would produce approximately 3 metric tons of CO_2 per day over the life of the project. Total GHG emissions resulting from the proposed activities would be approximately 2,050 metric tons of CO_2 [5] Vegetation replanting and natural re-seeding within the existing riparian area would offset the total project GHG emissions by approximately 20 metric tons of CO_2 over a five-year period. Additionally, project activities may result in opportunities to increase the amount of riparian and upland vegetation.

Based on the above calculations, which estimate the project's carbon emission, the Proposed Project would not generate significant increases in GHGs or an ongoing increase in the demand for off-site energy production because there would be no new facilities constructed. While the project's GHG emissions associated with the use of heavy equipment would be measurable over the course of the project, GHG emissions and any effects on global climate change would not be cumulatively significant considering the amount of GHG emissions generated by the Proposed Project and the current local air quality conditions. While Reclamation activities may result in some opportunities to increase the amount of riparian and upland vegetation that could be established and/or enhanced, overall, the impacts of the Proposed Project with respect to GHG would be less than significant.

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[2] The amount of fuel used by the project is based on operating three of the six pieces of heavy equipment, which have an average fuel consumption of 95 gallons per day. Types of heavy equipment used for construction activities would include a 321 excavator, D7 dozer, 325 off road dump truck, 627 scraper, 966 loader, and 160H motor grader.

[3] The amount of vegetation disturbance is based on Wildlife Habitat Relationship acreage that would be disturbed by the Remaining Phase 1 sites.

[4] This timeframe was based on the average number of days it would take to complete each site based on Remaining Phase 1 projections.

[5] The mobile combustion CO_2 Emissions Calculation Tool was used to calculate GHG emissions for combust ble fuel (Greehhouse Gas Protocol Initiative 2005), and the Construction Carbon Calculator was used to calculate GHG emissions for vegetation loss (BuildCarbonNeutral 2007). The calculation is based on 23 days of construction per site as estimated for the Remaining Phase 1 sites and includes diesel fuel combustion and loss of vegetation.

GHG emissions associated with Alternative 1 would be less than the amount of emissions generated by the Proposed Project because less construction activity would occur and, therefore, less combustion associated with engines, possibly less vegetation burning, and less project generated transportation. The following quantities of combustible fuel and vegetation disturbance were used to determine the carbon footprint for Alternative 1: an average of 285 gallons/day of diesel fuel would be used by construction equipment, and an average of 29 acres of vegetation could be removed per site. It would take approximately 580 days to complete construction activities for Alternative 1.

Based on the above estimates, Alternative 1 would produce approximately 85 percent of the GHG emissions produced by the Proposed Project. Total GHG emissions resulting from Alternative 1 would be approximately 1,754 metric tons of CO_2. Vegetation replanting and natural re-seeding would offset the total project GHG emissions by approximately 14.5 metric tons of CO_2. Based on the above calculations, which estimate the project's carbon emission, Alternative 1 would not generate significant increases in GHG or an ongoing increase in the demand for off-site energy production because there would be no new facilities constructed. Similar to the Proposed Project, the impact of Alternative 1 relative to GHG and effects on climate change would be less than significant.

Mitigation Measures

No-Project Alternative, Proposed Project, Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.11-5: Construction activities would generate short-term and localized fugitive dust, gas and diesel emissions and smoke that could affect adjacent residences and schools. *No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.*

No-Project Alternative

Under the No-Project Alternative, there would be no construction or transportation activities because the project would not be implemented. Therefore, there would be no impact.

Proposed Project and Alternative 1

Construction activity associated with the Remaining Phase 1 and Phase 2 sites would generate fugitive dust, gas, and diesel emissions and the project could generate smoke from vegetation burn piles; all of which could expose a substantial number of adjacent residents and three nearby elementary schools to air pollutants. Schools and residences are considered sensitive receptors. Therefore, this would be a significant impact.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

4.11-5a Construction activity occurring within 300 feet of the Lewiston or Douglas City elementary schools will be limited to the period when school is not in session.

4.11-5b Construction activity occurring within 300 feet of residences will be limited to Monday through Saturday, from the hours of 9 a.m. to 5 p.m.

4.11-5c Reclamation will notify residences within 300 feet of Remaining Phase 1 and Phase 2 and project activity and the Lewiston, Douglas City, and Junction City elementary schools will be notified of construction activity located near the schools prior to site construction activities.

4.11-5d Reclamation will ensure that a notice is posted at/adjacent to the rehabilitation sites, which contains a phone number for the public to contact for concerns related to air quality.

Significance after Mitigation

Less than significant

SECTION 4.12

Aesthetics

4.12 Aesthetics

This section describes the aesthetic values and visual resources known to occur in the Trinity River basin in close proximity to the proposed Remaining Phase 1 and Phase 2 sites. It also evaluates potential impacts to aesthetic values and visual resources from implementation of the Proposed Project and its alternatives.

4.12.1 Environmental Setting

Regional Setting

The Trinity River provides aesthetic values and visual resources for residents of and visitors to Trinity County. The scenic quality of the river is vital to the county's communities and residential areas and contributes significantly to the recreational allure of the county. As part of the federal Wild and Scenic River System, the Trinity River below Lewiston Dam to its confluence with the Klamath River has been designated as "recreational."

Two scenic highways cross Trinity County, the Siskiyou-Trinity Scenic Byway (SR 3) and the Trinity Scenic Byway (SR 299). The Siskiyou-Trinity Scenic Byway, formerly known as the Trinity Heritage Scenic Byway, includes 120 miles of road beginning south of Hayfork and continuing north past Trinity Lake to Edgewood at I-5. The Trinity Scenic Byway follows SR 299 between Redding and Arcata, California. This byway is approximately 140 miles long and bisects Trinity County as it parallels the Trinity River.

Since the construction of the TRD, the flow regime of the Trinity River has been significantly changed (U.S. Fish and Wildlife Service and Hoopa Valley Tribe 1999). Prior to the 2000 ROD, flows in the Trinity River were maintained at relatively constant levels, although influenced to some degree by carryover storage and high run-off events on a periodic basis. The alteration of natural flow patterns resultant from TRD operations prior to the 2000 ROD resulted in substantial changes in the ecology and landscape features in the channel and floodplain downstream of the TRD facilities. Subsequent to the 2000 ROD, the TRRP has modified the controlled releases from the TRD to meet the overall objectives of the TRRP as described in Chapter 2 of this document.

Visual Environment

The visual environment, or character, is a function of both the natural and artificial landscape features that make up a view. Geologic, hydrologic, botanical, wildlife, recreational, and urban features such as roads, homes, and earthworks directly influence the visual character of an area. The perception of the visual character of an area can vary significantly by season and even by hour as light, shadow, weather, and the elements that compose the view change. Form, line, color, and texture are the basic components used to describe visual character and quality for most visual assessments (Federal Highway Administration 1983). The dominance of each of these components on the landscape serves to form the viewer's impression of the area. A viewer's impression directly corresponds to the aesthetic value of the landscape. The aesthetic value of an area is a measure of its visual character and scenic quality combined with the viewer response.

Visual Sensitivity and Viewer Response

The overall response of a viewer to the quality of a view is based on a combination of viewer exposure and viewer sensitivity. Viewer exposure refers to the visibility of resources in the landscape, the proximity of the vantage point to the view, the elevation of the viewer relative to the view, the frequency and duration of the viewing, the number of observers, and preconceived expectations of individual viewers or groups. Viewer sensitivity relates to the extent of the public's concern for particular landscapes. Judgments of visual quality and viewer response should be based on the regional frame of reference (U.S. Soil Conservation Service 1978). The geographical setting and nature of the visual resource will significantly influence the degree of visual quality and sensitivity experienced by the viewer. For example, the presence of a small hill in an otherwise flat landscape may be viewed as a significant visual element, but the hill may have very little significance when located in mountainous terrain.

Within the 40-mile reach of the Trinity River below Lewiston Dam, the Trinity River corridor is a dominant component of the visual environment. Gravel bars, riparian vegetation, and constructed features throughout the corridor contribute to the visual character of the existing landscape.

Viewshed

The Federal Highway Administration (1983) defines a viewshed as all of the surface area visible from a particular location (e.g., a highway pull-out) or sequence of locations (e.g., a highway or trail). Viewsheds are referred to as visual assessment units (VAU) throughout this section of the document. The VAUs were established to represent views of visually sensitive resources observed from various locations surrounding homes, public access areas, or roads in the project vicinity.

Light and Glare

Because of the rural nature of the Trinity River corridor, the primary sources of artificial light are limited to vehicles passing through the area on state, local and private roads; concentrations of commercial/residential buildings; and, to a lesser degree, recreational features and facilities. Glare may occur during the daylight hours as the sun is reflected off the river or light-colored alluvium associated with the floodplain of the Trinity River.

Viewer Groups

The perceptions of viewers are influenced by their location, specific activities in which they are engaged, personal degree of awareness, and individual values and goals. The three distinct viewer groups that could be affected by the activities described in Chapter 2 are motorists, residents, and recreationists.

Motorists

Motorists are those persons who would view the Remaining Phase 1 or Phase 2 sites from a moving vehicle. Motorists may be drivers or passengers. This user group typically consists of commuters, local residents, business travelers, and tourists. Tourists are often acutely aware of viewshed opportunities and aesthetics associated with the project area when viewed from roadways. Business travelers, commuters, and local residents who travel the same routes frequently may be acclimated to the general view, but are more likely to be aware of visual changes than the occasional passersby. In general, views of the river corridor from roadways are somewhat limited and of short-duration for motorists.

Residents

Residents are people whose homes and/or property are in close proximity to, and have a view of, a rehabilitation site or a portion of a site. The existing landscape features associated with the Remaining Phase 1 and Phase 2 sites offer a variety of visual experiences that reflect various land use practices and natural processes. The individual sensitivity of residents to aesthetics and changes within a viewshed is highly variable. The sensitivity of residents to changes in the viewshed should also be considered in the context of view point location and the length of time that the view may be altered (e.g., temporary or permanent changes to topography or vegetation as a result of construction activities and future adjustments to the morphology of the river).

Recreationists

Recreationists are members of the community or the general public who use the recreational resources available within or adjacent to the Remaining Phase 1 and Phase 2 sites. Like residents, recreational users are highly sensitive to the visual character of the river corridor since most are drawn to the area by an appreciation of its scenic nature.

Historically (since the TRD was constructed), the primary recreational activities along the reach of the Trinity River in the vicinity of the Remaining Phase 1 and Phase 2 have been those associated with warm summer temperatures (Memorial Day to Labor Day), and fishing for anadromous salmonids throughout the year. The post-ROD flow regime described in section 4.4 (Water Resources) has resulted in a substantial increase in use by whitewater enthusiasts during the spring and early summer (April to July). The Trinity River, particularly the reach below Lewiston Dam, provides a myriad of recreational opportunities that are discussed in section 4.8 (Recreation).

Visual Assessment Units and Key Observation Points

VAUs, areas of distinct visual character within the viewshed, provide a framework for comparing the visual effects of a proposed project. Within each VAU, key observation points[1] (KOPs) are identified along commonly traveled routes or other likely observation points from which a representative group (i.e., residents, recreationists, or motorists) could view project sites. However, the programmatic nature of this section precludes the use of VAUs and KOPs.

[1] Points from which the project boundary or portions thereof are visible from sensitive receptor areas, such as major travel routes and/or surrounding homes.

4.12.2 Environmental Impacts and Mitigation Measures

Methodology

Analysis of potential impacts to aesthetic resources relative to the Remaining Phase 1 and Phase 2 sites is based on the significance criteria described in Appendix G of the CEQA Guidelines (Association of Environmental Professionals 2008). The Regional Water Board, acting as the CEQA lead agency, has used these criteria to develop significance thresholds. Significance thresholds are used to evaluate the proposed project's potential impact on the visual character of the project area with an emphasis on VAUs that are selected to characterize the aesthetic values and visual resources. From a programmatic perspective, this section of the document provides a general discussion of the type and magnitude of impacts that could occur as a result of the project. All assessments are qualitative, evaluating potential impacts of the Proposed Project and its associated alternatives on viewsheds in the context of the Trinity River corridor. A review of the consistency of the Proposed Project and its alternatives with federal and state Wild and Scenic River designations is presented in Appendix B.

Significance Criteria

The project would have a significant impact if it

- obstructs a scenic view from public viewing areas;
- has a substantial adverse effect on a scenic vista;
- substantially damages scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- substantially degrades the existing visual character or quality of the project site and its surroundings;
- introduces physical features that are substantially out of character with adjacent residential areas;
- alters the site so that the scale or degree of change appears as a substantial, obvious, and disharmonious modification of the overall scene (to the extent that it clearly dominates the view);
- creates substantial daytime glare associated with new construction;
- disrupts adjacent residential areas because of new night-time lighting;
- creates a new source of substantial light or glare that would adversely affect day or nighttime views in the site;
- is inconsistent with the policies of the Trinity County and local general plans relating to aesthetics; or

- is inconsistent with the goals and objectives of either the federal or state WSRA with regards to the Trinity River.

Impacts and Mitigation Measures

Table 4.12-1 summarizes the potential aesthetic impacts resulting from construction and operation of the No-Project Alternative, the Proposed Project, and Alternative 1.

Table 4.12-1. Summary of Aesthetic Impacts for the No-Project Alternative, Proposed Project, and Alternative 1

No-Project Alternative	Proposed Project	Alternative 1	Proposed Project with Mitigation	Alternative 1 with Mitigation
Impact 4.12-1. Implementation of the project could result in the degradation and/or obstruction of a scenic view from key observation areas.				
No Impact	Significant	Significant	Less than Significant	Less than Significant
Impact 4.12-2. Implementation of the project could substantially change the character of, or be disharmonious with, existing land uses and aesthetic features.				
No impact	No impact	No impact	No impact	No impact
Impact 4.12-3. The project may be inconsistent with federal and state Wild and Scenic River Act or Scenic Byway requirements.				
No Impact	Less than Significant	Less than Significant	Not applicable[1]	Not applicable[1]
Impact 4.12-4. The project could generate increased daytime glare and/or nighttime lighting.				
No Impact	Less than Significant	Less than Significant	Not applicable[1]	Not applicable[1]

[1]Because this potential impact is less than significant, no mitigation is required.

Impact 4.12-1: Implementation of the project could result in the degradation and/or obstruction of a scenic view from key observation areas. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, the degradation and/or obstruction of a scenic view from key observation areas would not occur because the project would not be constructed. While a number of restoration and rehabilitation activities that have influenced the scenic view or character of the Trinity River corridor have been implemented, or are ongoing, these are considered as part of the environmental baseline for this analysis. There would be no impact under this alternative.

Proposed Project and Alternative 1

As previously discussed, the Remaining Phase 1 and Phase 2 sites are located along the Trinity River corridor between Lewiston and the North Fork Trinity River, near Helena California. Potential impacts of either the Proposed Project or Alternative 1 within certain VAUs associated with one or more of these sites would include changes brought about by the removal of vegetation, construction of inundated surfaces, new access roads, the creation of staging and gravel processing areas, and sediment management activities. These various activities are intended to restore the form and function of an alluvial river, thereby enhancing the overall aesthetic values and visual resources associated with the Trinity River and the surrounding landscape. While these impacts are expected to be temporary in nature and the long-term outcome should improve the visual diversity of the corridor, the short-term impacts will persist for some period. Therefore, this impact is significant.

Mitigation Measures

No-Project Alternative

No significant impacts have been identified. Therefore, no mitigation is required.

Proposed Project and Alternative 1

In order to minimize impacts to visual resources resulting from the removal of vegetation in the project area, mitigation measures 4.7-1a through 1c, as described in section 4.7 (Vegetation, Wildlife, and Wetlands), will be implemented where applicable for either alternative.

Visual impacts related to water quality (e.g., the potential for increased turbidity to adversely impact the aesthetic quality of the river) will be mitigated through the implementation of mitigation measures 4.8-3a through 3f, as described in section 4.8 (Recreation). These measures will be implemented where applicable for either alternative.

Significance after Mitigation

Less than significant

Impact 4.12-2: Implementation of the project could substantially change the character of, or be disharmonious with, existing land uses and aesthetic features. *No impact for the No-Project Alternative; less-than-significant impact for the Proposed Project and Alternative 1.*

No-Project Alternative

Under the No-Project Alternative, no changes would occur to the character or harmony of aesthetic features and existing land uses because the project would not be constructed. Therefore, there would be no impact.

Proposed Project and Alternative 1

Activities associated with either the Proposed Project or Alternative 1 are intended to be not only functional (e.g., enhance fisheries and restore river sinuosity), but to complement the aesthetic values and visual resources associated with the various rehabilitation sites. Overall, either alternative incorporates the project area's diversity of landscapes and vegetation types to define the location, character, and magnitude of the rehabilitation activities at these sites. For example, under either alternative, materials excavated from riverine areas would be removed to upland areas or used as a source of coarse sediment to enhance the alluvial function of the river. Material transported to upland activity areas would be placed in a manner that blends the materials into the contours of the existing dredge tailing piles while not changing the nominal heights of the piles. Retention of existing topographic features would significantly lessen the degree of visual impact.

The activities described in Chapter 2 provide a framework for reestablishing the physical process necessary to enhance the alluvial attributes of the river channel and floodplain over time, particularly those attributes that are flow dependent. Although either alternative varies in the degree to which the channel and floodplain would be affected, over time, either alternative would produce gradual, ever-improving changes in the aesthetic quality of this reach of the Trinity River, while maintaining the character of the surrounding land uses. Because changes associated with either the Proposed Project or Alternative 1 would retain the character of existing land uses and features, selection of either of these alternatives would result in a less-than-significant impact on aesthetic resources.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impacts have been identified. Therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.12-3: The project may be inconsistent with the federal or state Wild and Scenic River Acts or Scenic Byway requirements. ***No impact for the No-Project Alternative; less-than-significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, no changes would occur that would be inconsistent with the federal or state WSRA or Scenic Byway requirements because the project would not be constructed. Therefore, there would be no impact.

Proposed Project and Alternative 1

Under Section 7 of the WSRA, direct and adverse effects to the values for which the Trinity River was recognized as a Wild and Scenic River are prohibited. Implementation of either the Proposed Project or Alternative 1 would be consistent with these values because the activities would not be considered substantially out of character with the current aesthetic conditions. Implementation of either of the action alternatives would result in a less-than-significant impact to WSRA and Scenic Byway requirements.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impacts have been identified. Therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.12-4: The project could generate increased daytime glare and/or nighttime lighting. ***No impact for the No-Project Alternative; less-than-significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, no changes in daytime glare or nighttime lighting would occur because the project would not be constructed. Therefore, there would be no impact.

Proposed Project and Alternative 1

Under either the Proposed Project or Alternative 1, significant increases in daytime glare and/or nighttime lighting are not anticipated to occur. Construction activities would not take place during nighttime hours; therefore, nearby homes and motorists traveling on roads adjacent to the river corridor would not be subjected to the headlights of construction equipment or stationary spotlights. Material removed from the floodplain and deposited at various activity areas is generally not reflective and would not increase the level of daytime glare observable to the viewer. Some changes may occur in the locations and amounts of glare produced by water over the constructed inundation surfaces, but, overall, these changes would be short-lived and variable by day, as well as season. The impacts of these changes would therefore be less than significant.

The most likely viewer group to be affected by daytime glare would be residents, but this would affect only a few residences at any one time. Occurrences of daytime glare produced by the sun reflecting off the water or construction equipment would be of short duration, or in the case of the latter, temporary. Such an impact would be less than significant.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impacts have been identified. Therefore, no mitigation is required.

Significance after Mitigation

Not applicable

SECTION 4.13

Hazards and Hazardous Materials

4.13 Hazards and Hazardous Materials

This section evaluates hazards and hazardous materials that may currently be present in the Trinity River basin in proximity to the Remaining Phase 1 and Phase 2 sites. In addition, this section assesses potential health hazards that could result from implementation of the Proposed Project or its alternatives.

4.13.1 Environmental Setting

Regional Setting

Federal, state, and local agencies regulate hazardous materials and hazardous waste. In part, these agencies direct the proper disposal or recycling of such materials and waste. Nonetheless, illegal storage and disposal and unintentional releases of hazardous materials or waste from leaks and accidents can occur when hazardous materials are used or hazardous waste is generated by a project. Regional roadways including SR 299, SR 3, Lewiston Road, Rush Creek Road, Trinity Dam Boulevard, Brown's Mountain Road, Goose Ranch Road, Steiner Flat Road, Steel Bridge Road, and Red Hill Road are frequently used to transport hazardous materials throughout Trinity County. Under the California Code of Regulations (CCR), Title 13, Section 1150-1194, and CFR, Title 49, the California Highway Patrol (CHP) regulates the transport of hazardous materials. When a spill of hazardous material or waste occurs on a highway, the CHP is responsible for directing cleanup and enforcement (CCR Section 2450-2453b).

When a spill involving a hazardous material or hazardous waste occurs on public land, it is the respective land management agency's responsibility to initiate and direct cleanup, to initiate investigation and direct enforcement, and to contact the necessary personnel for performing these functions. When a hazardous material or waste spill occurs on private lands, the property owner is responsible for cleanup. For spills on private lands, Trinity County Environmental Health Department (TCEHD) acts to contact the proper personnel and ensures that cleanup is conducted according to federal, state, and local regulations.

Title 27 of the California Health and Safety Code (Article 1, Section 15100) established a unified program to deal with hazardous waste and materials in California (California Environmental Protection Agency 2007). The program consolidated six state environmental programs into one program under the authority of a Certified Unified Program Agency (CUPA). Programs that have been consolidated consist of the Hazardous Materials Business Plan/Emergency Response Plan, Hazardous Waste, Tiered Permitting, Underground Storage Tanks, Aboveground Storage Tanks (Spill Prevention Control and Countermeasure only), and the Uniform Fire Code Hazardous Materials Management Plan. The CUPA is typically a local agency that is certified by the California Environmental Protection Agency (CalEPA) to implement the state's six environmental programs.

In Trinity County, a local agency has not yet taken on the role of the CUPA lead. Thus, CalEPA has designated the Department of Toxic Substances Control as the acting CUPA (California Environmental Protection Agency 2008). While larger, more urban areas can benefit greatly from the formation of a local CUPA, the overwhelming costs and training required for rural areas, such as Trinity County, to implement this program at a local level can impede its formation. Specifically, Trinity County has not formed a local CUPA because

- no significant public or environmental health benefit has been identified for implementing these programs in rural areas that do not have an industrial base;
- the CalEPA incentive funding, allotted in 2001, to the non-CUPA authority is not guaranteed and is dependent on the annual California budget (eligibility for such funding requires a full commitment from the County to participate as a CUPA);
- the program requires annual reporting and periodic state audits that would require approximately 100 hours of staff time annually, without any direct benefit to public health;
- there would be a substantial increase in the County's liability as a result of its accepting the responsibility for hazardous materials law enforcement; and
- inspector proficiency would be extremely challenging due to the complexity of the hazardous material laws and the lack of local inspector opportunities (Trinity County 2003). Establishing and maintaining staff proficiency would be a problem and would increase County liability (Trinity County 2003).

Although the CalEPA is responsible for administering CUPA programs in Trinity County, there is one exception. The TCEHD has administered the County's Underground Tank Program for more than a decade. The County adopted this program as a proactive measure directed at stemming the occurrence of groundwater contamination caused by leaky underground fuel storage tanks. To ensure operator compliance and to protect the county's groundwater and drinking water supplies, this program requires that the TCEHD permit and conduct annual inspections of all in-county underground fuel tanks.

Uncontrolled or abandoned places throughout the nation where hazardous waste poses a possible threat to local ecosystems or people are referred to as "Superfund" hazardous waste sites by the EPA, and are included in the EPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database. A search for occurrences of Superfund sites in Trinity County yielded three locations within less than 20 miles of some rehabilitation sites. Table 4.13-1 lists these Superfund sites and their general locations and proximity to the nearest rehabilitation site. Although these locations are Superfund sites, they are not included on the National Priorities List, which consists of those sites known or likely to release hazardous substances, pollutants, or contaminants.

Table 4.13-1. Hazardous Waste Locations Recorded in Trinity County, California

Site Name	Status	Location	Approximate Distance from Nearest Rehabilitation Site
Cheek Skyline Logging	Active	South of Highway 3 Douglas City, CA	<0.5 miles
Kingsbury Creek Mine Lab	Active	Shasta Trinity NF Hayfork, CA	15 miles
USFS Drinkwater Gulch Mine	Active	T31N, R12W, Section 6 Hayfork, CA	17 miles

Source: U.S. Environmental Protection Agency 2007

Toxins

Toxicity concerns in the Trinity River focus on polluted runoff from abandoned mines and mining activities, sediment released from subdivision development, land uses (e.g., road use and timber management) in areas susceptible to surface erosion and mass wasting, septic tank use, aboveground and underground tanks, and lumber mills. The accumulation of the toxin mercury in aquatic biota is well documented throughout the Trinity River basin. Under EPA's California Toxics Rule, the total allowable concentration of measured mercury in unfiltered water should not exceed 0.050 parts per billion (ppb). Mercury levels above this concentration could result in adverse health effects to humans and aquatic life. Overall, the USGS's recent assessments of site-specific methylation data from several channel rehabilitation sites (e.g., Hocker Flat and Indian Creek unpublished data) suggest that the bioavailability of mercury in the Trinity River floodplain is not presently high and will not be increased by broad-scale project implementation. These toxins are addressed in section 4.5, Water Quality. Based on USGS's assessment of environmental conditions and monitoring data from the Hocker Flat and Canyon Creek sites (and limited sampling at Indian Creek, Dark Gulch, and Lowden Channel rehabilitation sites, USGS unpublished data), conditions are not generally present that would result in methylation of mercury, creating methylmercury, which is bioavailable for uptake through the food web. Consequently, disturbance of gravels or sediments at the channel rehabilitation sites resulting from activities described in Chapter 2 would not be expected to result in a measurable increase in current background mercury or methylmercury concentrations in the environment.

Flooding

Water level fluctuations, particularly those that occur rapidly, pose a distinct hazard to residents and visitors along the waterways in Trinity County. The flood season in the Trinity River basin typically occurs between October and April, when over 90 percent of the annual precipitation falls. To some extent, the TRD controls floods on the mainstem Trinity River, but substantial flood events have occurred as recently as 2005. Section 4.4 provides a detailed discussion of water resources, including the types and variability of flood flows on the Trinity River.

Seismic Events

Infrequently, seismic events occur in the region generally in the form of low to moderate levels of ground shaking associated with nearby or distant earthquakes. The potential for landslides triggered by seismic events is not significant within the corridor of the mainstem Trinity River, due to the low level of historical occurrence of seismic activity in the region. However, the steep topography and shallow, erosive soils found in much of the region increase the potential for landslides and rockfalls triggered by seismic events, precipitation, or other types of disturbances.

Landslides are a common occurrence along roads in Trinity County, although the road prism typically intercepts the slide material and it rarely reaches the waterways. Downstream of the North Fork Trinity River, the potential for slope failures during seismic events increases due to very steep slopes and unstable geologic materials. While unlikely, a large landslide could result in a short-term dam, resulting in a phenomenon known as a dam-break flood. This type of event could have wide-ranging repercussions downstream of the rehabilitation sites. Section 4.3 provides a detailed discussion of geologic hazards that could be associated with the Remaining Phase 1 or Phase 2 sites.

Roadways

Due to topography, coupled with the distribution and density of the communities in the Trinity River basin, there are relatively few options for road alignments in Trinity County. Therefore, equestrians, pedestrians, bicyclists, and motor vehicles commonly use the same roadways. While generally well maintained, the County’s roads often follow the narrow, winding corridor of the Trinity River and its tributaries. Three 2-lane, state highways—SR 299, SR 3, and SR 36—pass through Trinity County. In addition, a number of county roads provide access to the communities and neighborhoods described in section 4.2. Typically, these roads are paved with at least two lanes and minimal shoulders. Section 4.16 provides additional details regarding transportation and traffic.

One notable characteristic of Trinity County’s roadway system is the lack of any traffic signals (LSC Transportation Consultants 2005). In 2006, there were 106 automobile accidents in the unincorporated areas of Trinity County that resulted in injury; six of these accidents resulted in fatalities (State of California Department of Highway Patrol 2008). The CHP patrols state highways, while the Trinity County Sheriff’s Department (TCSD) patrols both state highways and county roads.

Wildland Fire

Steep topography and a mosaic of mixed-conifer, hardwood, and chaparral woodlands coupled with typically hot, dry summers create extreme fire danger throughout most of Trinity County. Human-caused fires, particularly along roadways and other developed areas, are relatively common, although the County is also frequently subject to lightning-caused fires. Wildland fire, regardless of the cause, can be detrimental to watershed function, killing vegetation, burning the organic matter in litter and soil, and forming impervious soil layers, factors that contribute directly to accelerated runoff and erosion from the watershed during and immediately after a storm event. Concentrated runoff discharged over a short period can result in increased flood hazards. Exposed soils and increased runoff can lead to an increased risk of landslides.

Trinity County fire protection needs are met by 16 volunteer fire departments dispersed throughout the county, Cal Fire, and the USFS. By law, Cal Fire is responsible for wildland fire protection on all private lands in Trinity County, and the USFS is responsible for wildland fire protection on all federal National Forest lands. However, Cal Fire also contracts with the BLM to provide wildland fire protection on its public lands. Both Cal Fire and the USFS fire stations are staffed only during the summer fire season, which normally lasts from May to November.

The volunteer fire departments are responsible for structural fire protection and rescue services in Trinity County throughout the year. The Lewiston Volunteer Fire Department (VFD), the Douglas City VFD, and the Junction City VFD provide services within their respective general plan areas; however, each department also routinely responds to calls outside of its legal boundaries if it is dispatched by the County’s 911 Center, which is maintained by the TCSD (Trinity County 2003).

Evacuation Routes

The Safety Element of the Trinity County General Plan (Trinity County 2003) identifies specific major evacuation routes in the event of an emergency. Steep topography, the Trinity River, and the sizable Trinity Alps Wilderness substantially limit evacuation options in the part of Trinity County in which the Remaining Phase 1 and Phase 2 sites are located. In general, SR 299, which extends east/west through the county, and SR 3, which extends generally north/south through the County, are the primary evacuation routes for the region (Figure 4.13-1).

Local Setting

A number of structures, homes, commercial buildings, and recreational facilities occur within or in close proximity to the Remaining Phase 1 and Phase 2 sites. The 40-mile reach of the Trinity River below Lewiston Dam is also popular for recreational uses such as rafting, swimming, and angling. In the past two years, only four hazardous materials spills have been recorded in the vicinity of Lewiston, Douglas City, or Junction City (The Governor's Office of Emergency Services 2008). Three of these involved petroleum byproduct spills (i.e., diesel, gasoline and hydraulic fluid), only one of which discharged a hazardous substance (gasoline) into a waterway, and all of which were contained. The fourth reported spill involved a report of contaminated drinking water at a mobile home park in Lewiston. Hazardous materials spill reports filed with the Governor’s Office of Emergency Services indicate that none of these spills involved greater than 100 gallons of hazardous materials (The Governor's Office of Emergency Services 2008).

Toxins

The potential hazards posed by latent mercury are addressed in section 4.5, Water Quality. Elevated levels of mercury may occur in placer tailings piles, alluvial deposits of fine sediments (bed and bank), and wetland features associated with dredge tailings and gravel mining pits (e.g., ponds).

Wildland Fire

Since 1911, when documentation of fire start locations and causes (human versus natural) began in California, a pattern of human-caused fires has emerged along the SR 299 corridor (Trinity County

Planning Department 2002). Concentrated development in the Lewiston, Douglas City, and Junction City areas significantly increases the potential for human-caused fire starts when compared to the rest of Trinity County. The forested uplands in the Trinity River corridor are at a greater risk of damage from wildfire than lands within the boundaries of the Remaining Phase 1 and Phase 2 sites due to the proximity of the river and the type and amount of riparian vegetation. These types of alluvial landscapes are not as prone to wildland fires as forested uplands, although wildland fires often affect these types of landscapes, particularly when subjected to high intensity fires. To ensure that construction work at rehabilitation sites does not introduce fire, fire prevention measures will be included during project implementation (Chapter 2 – construction methods)

Evacuation Routes

Many of the Remaining Phase 1 and Phase 2 sites are in relatively close proximity to SR 299 and, to a lesser degree, SR 3, which are the primary evacuation routes in Trinity County. Project sites not immediately adjacent to these highways are generally in close proximity to major secondary arterial routes including Rush Creek Road, Lewiston Road, Goose Ranch Road, and Trinity Dam Boulevard.

4.13.2 Environmental Impacts and Mitigation Measures

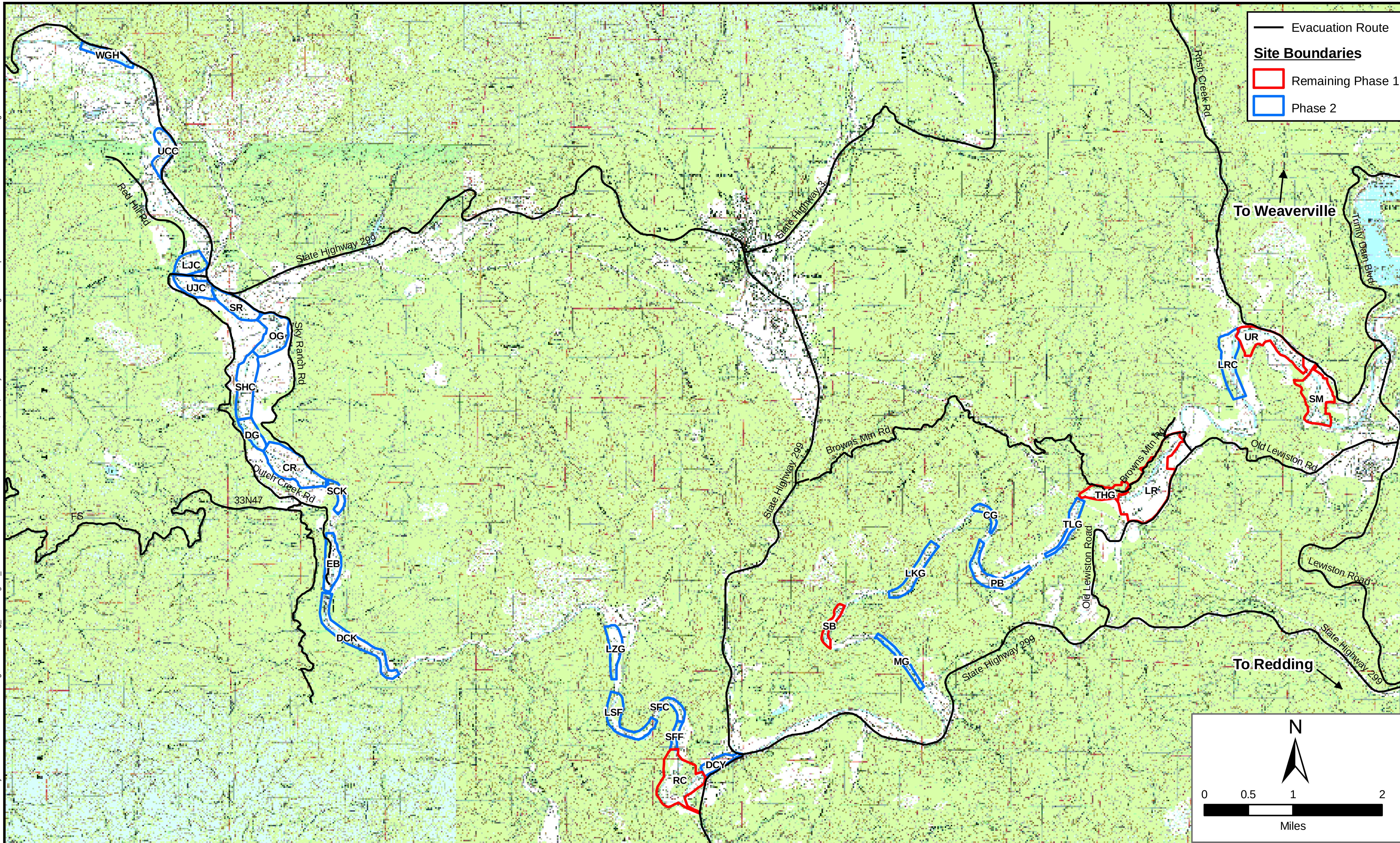
Methodology

Hazards and hazardous materials associated with the rehabilitation sites were assessed in the field by TRRP staff. In addition, Trinity County Planning Department and Environmental Health Department staff were consulted regarding the potential for hazardous substances to occur in the general vicinity of the project boundaries.

Significance Criteria

An impact related to hazards and hazardous materials would be significant if the project would

- involve the use, production, or disposal of materials that pose a hazard to people or to animal or plant populations in the area affected;
- create a substantial potential public health or safety hazard due to risk of upset (accidents);
- create a substantial potential public health or safety hazard due to a reasonably foreseeable release of hazardous materials and/or hazardous waste (i.e., from contaminated soil);
- violate applicable laws intended to protect human health and safety or expose employees to working situations that do not meet health standards;
- physically interfere with, or impair implementation of, emergency response plans or emergency evacuation plans;
- substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);



File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_4-13-1.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-16-08 Revised: 11-20-08 edouglas

North State Resources, Inc.

Trinity River Restoration Program: Remaining Phase 1 and Phase 2 Sites

Figure 4.13-1
Major Evacuation Routes

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- be located on a site that is included on a list of hazardous materials sites compiled pursuant to *California Government Code* Section 65962.5 and, as a result, create a significant hazard to the public or the environment;
- emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school; or
- expose people or structures to a significant risk of loss, injury, or death involving wildland fires.

Impacts and Mitigation Measures

Table 4.13-2 summarizes the potential hazards and hazardous materials impacts that could result from construction of the project.

Table 4.13-2. Summary of Hazards and Hazardous Materials Impacts for the No-Project Alternative, Proposed Project, and Alternative 1

No-Project Alternative	Proposed Project	Alternative 1	Proposed Project with Mitigation	Alternative 1 with Mitigation
Impact 4.13-1. Implementation of the project could increase the potential for release of, or exposure to, potentially hazardous materials that could pose a public health or safety hazard.				
No impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]
Impact 4.13-2. Construction activities associated with the project may interfere with emergency response and evacuation plans by temporarily slowing traffic flow.				
No impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]
Impact 4.13-3. Implementation of the project may contribute to wildland fire potential and catastrophic fire behavior in the project area.				
No impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]
Impact 4.13-4. Implementation of the project may contribute to an increased risk of landslides and flooding.				
No impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]

[1] Because this potential impact is less than significant, no mitigation is required

Impact 4.13-1: Implementation of the project could increase the potential for release of, or exposure to, potentially hazardous materials that could pose a public health or safety hazard. ***No impact for No-Project Alternative; less-than-significant impact for Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, construction activities that could potentially release hazardous substances (e.g., oil, gas, diesel, and mercury) into the environment at levels that could pose a health or safety hazard to the public would not occur because the project would not be constructed. Therefore, there would be no impact.

Proposed Project and Alternative 1

Activities associated with either the Proposed Project or Alternative 1 would utilize potentially hazardous materials (e.g., oil and fuels) associated with the operation of vehicles and construction equipment during project construction. These materials are similar to those routinely used for other types of construction projects throughout Trinity County. The widespread use and associated transport of these materials along the highways and county roads that traverse Trinity County, combined with the low level of incidents (spills), suggest that impacts related to rehabilitation activities would be similar to that elsewhere in Trinity County. Given the temporary nature of construction and the distance from residences, schools, and frequently used recreation areas, implementation of BMPs would minimize the potential for any project-related hazardous materials becoming a public hazard.

The potential for construction activities associated with the Proposed Project to result in the significant exposure of the public and the environment to the adverse effects of hazardous substances (e.g., oil, gas, and diesel) would be greater than those associated with Alternative 1 due to the decrease in magnitude and duration of the construction activities associated with Alternative 1. Under either alternative, this impact would be less than significant.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.13.2: Construction activities associated with the project may interfere with emergency response and evacuation plans by temporarily slowing traffic flow. ***No impact for No-Project Alternative; less-than-significant impact for Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, construction activities that could interfere with emergency response and evacuation plans would not occur because the project would not be constructed. Therefore, there would be no impact.

Proposed Project and Alternative 1

Under either the Proposed Project or Alternative 1, construction traffic would include the mobilization and demobilization of construction equipment (e.g., scrapers, excavators, and bulldozers) to and from the Remaining Phase 1 and Phase 2 sites over the course of the next five to ten years. Once the equipment is on the site, construction traffic would be limited to daily trips for personnel and routine service and supply vehicles. Construction activities would be managed to ensure that emergency response and evacuation plans are not impeded.

Under the Proposed Project, the potential to interfere with emergency response and evacuation plans would be greater than that of Alternative 1 due to the larger magnitude of the Proposed Project. However, the impacts created by either alternative would be less than significant.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.13.3: Implementation of the project may contribute to wildland fire potential and catastrophic fire behavior in the project area. ***No impact for No-Project Alternative; less-than-significant impact for Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, implementation of the project would have no impact on wildland fire potential or catastrophic fire behavior because the project would not be constructed. Therefore, there would be no impact.

Proposed Project and Alternative 1

Under either the Proposed Project or Alternative 1, most of the activities described in Chapter 2 would occur within or adjacent to the riparian corridor of the Trinity River. Potential fuels within the boundaries of the Remaining Phase 1 and Phase 2 sites (e.g., grasses and herbaceous weeds) are generally noncontiguous and the river serves as a substantial natural firebreak. The types and amounts of fuels and their continuity may be decreased temporarily by implementation of either action alternative, particularly in areas subject to vegetation removal, but any such changes would not be significant with respect to fire potential and behavior. In the long-term, potential fire conditions would be similar to those that currently exist (e.g., potential fuels would be limited to riparian vegetation, sporadic grasses, and herbaceous weeds). Either the Proposed Project or Alternative 1 would have a less-than-significant impact on wildland fire potential and behavior.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.13.4: Implementation of the project may contribute to an increased risk of landslides or flooding. ***No impact for No-Project Alternative; less-than-significant impact for Proposed Project and Alternative 1.***

No-Project Alternative

The No-Project Alternative would have no impact on the potential for landslides or flooding because the project would not be constructed. Therefore, there would be no impact.

Proposed Project and Alternative 1

Under either the Proposed Project or Alternative 1, most of the activities described In Chapter 2 would take place in the river channel or floodplain, both of which have relatively flat topography. Furthermore, neither action alternative involves alteration of toe-slopes adjacent to any geologically unstable areas (e.g., landslides).

Implementation of either the Proposed Project or Alternative 1 would result in either no change to the base flood elevation (BFE) or a reduction of the BFE, since stockpiled excavated material would be stored in the adjacent uplands. This would be a less-than-significant impact.

The potential for flooding would not be increased under either the Proposed Project or Alternative 1. Although Alternative 1 would require more constructed floodplain than the Proposed Project, the risk of flooding would be similar. This impact would be less than significant.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

SECTION 4.14

Noise

4.14 Noise

This section evaluates the potential noise impacts associated with implementation of proposed activities at the Remaining Phase 1 and Phase 2 sites. The following evaluation is based on a review of local land use plans and policies pertaining to noise and field reconnaissance to identify potential sensitive receptors within and adjacent to the project boundaries.

4.14.1 Environmental Setting

Existing Noise Levels

Noise is generally defined as excessive and unwanted sound emanating from noise-producing objects. Total environmental noise exerts a sound pressure level that is generally measured with an A-weighted decibel scale (dBA), which approximates the range of sound audible to the human ear (where 10dBA is at the low threshold of hearing and 120–140dBA is the threshold of pain). Human responses to noise are subjective and can vary. The effects of noise on people can be placed in the following three categories:

- subjective effects of annoyance, nuisance, and dissatisfaction;
- interference with activities such as speech, sleep, and learning; and
- physiological effects such as hearing loss or sudden startling (Trinity County Department of Transportation and Hughes Environmental Consultants 2003).

Environmental noise typically falls into one or both of the first two categories while workers in industrial plants typically experience noise in the last category. The subjective effects of noise are difficult to measure as are the corresponding reactions of annoyance and dissatisfaction. Individual tolerance thresholds vary widely based on an individual’s past experiences with noise. Intensity, duration, frequency, time pattern of noise, and existing background noises are some factors that can influence individual responses to noise. Table 4.14-1 lists examples of dBA levels for a range of noises.

Table 4.14-1. Noise Levels and Associated Effects for a Variety of Noise Types

Noise Source at a Given Distance	A-Weighted Sound Level in Decibels[a,b]	Noise Environments	Subjective Impression
Civil defense siren (100 feet)	140–130		Pain threshold
Jet takeoff (200 feet)	120		
	110	Rock music concert	Very loud
Pile driver (50 feet)	100		
Ambulance siren (100 feet)	90	Boiler room	
Freight cars (50 feet) Pneumatic drill (50 feet)	80	Printing press Kitchen garbage disposal	Loud
Freeway (100 feet)	70		Moderately loud
Vacuum cleaner (100 feet)	60	Data processing center Department store/office	

Table 4.14-1. Noise Levels and Associated Effects for a Variety of Noise Types

Noise Source at a Given Distance	A-Weighted Sound Level in Decibels[a,b]	Noise Environments	Subjective Impression
Light traffic (100 feet)	50	Private business office	Quiet
Large transformer (200 feet)	40		
Soft whisper (5 feet)	30	Quiet bedroom	
	20	Recording studio	
	0-10		Threshold of hearing

[a] A-Weighted Sound Level, dBA = The A-weighted filter de-emphasizes very low and very high frequency components of sound similar to the response of the human ear.

Noise measurements are usually taken over time to capture daily or hourly variances in noise levels. Noise levels taken over time are often reported in energy-equivalent noise level (Leq), the day-night average noise level (Ldn), and the community noise equivalent level (CNEL). Leq is an hourly average, while Ldn and CNEL are 24-hour weighted averages.

Table 4.14-2 lists the U.S. General Services Administration maximum noise levels allowed for government contract construction activities.

Table 4.14-2. U.S. General Services Administration Maximum Noise Levels Allowable for Government Contracts

Equipment	Sound Level (dBA) at 50 feet
Earthmoving	
Front loader	75
Backhoe	75
Dozer	75
Tractor	75
Scraper	80
Grader	75
Truck	75
Paver	80
Impact	
Pile driver	95
Jack hammer	75
Rock drill	80
Pneumatic drill	80

Table 4.14-2. U.S. General Services Administration Maximum Noise Levels Allowable for Government Contracts

Equipment	Sound Level (dBA) at 50 feet
Materials Handling	
Concrete mixer	75
Concrete pump	75
Crane	75
Derrick	75
Stationary	
Pump	75
Generator	75
Compressor	75
Other	
Saw	75
Impactor	75

Source: Sincero and Sincero 1996

Typical construction noise levels are shown in Table 4.14-3. The noise levels shown in this table assume the operation of various types of construction equipment, as shown in Table 4.14-4.

Table 4.14-3. Typical Construction Noise Levels

Construction Stage	Noise Level (dBA, L_{eq})[1]
Ground clearing	84
Excavation	89
Hauling	88
Revegetation	65

[1] Average noise levels 50 feet from the noisiest source and 200 feet from the rest of the equipment associated with a given construction stage. Noise levels correspond to public works projects (50 dBA ambient environments) (Bolt et al. 1971).

Table 4.14-4. Construction Equipment Noise

Type of Equipment	Maximum Level (dBA at 50 feet)
Truck	75
Scrapers	80
Bulldozers	75
Backhoe	75
Pneumatic tools	80

Source: Sincero and Sincero 1996

Noise is not considered a problem in Trinity County. Primary sources of noise in Trinity County include the following:

- highway traffic, especially commercial trucks (e.g., logging trucks, and tankers)
- sawmills
- airports (e.g., light planes and helicopters)
- mining (e.g., sand and gravel excavation)
- miscellaneous residential, commercial, and industrial sources

Noise in the general vicinity of the rehabilitation sites is primarily the result of local residential and commercial vehicle traffic and miscellaneous ambient sources such as river flow, river recreationists, overhead aircraft, barking dogs, and children at play. Several county arterial and secondary roads run parallel and adjacent to many of the project site boundaries.

While several of the Phase 2 sites are located in close proximity to SR 299 or SR 3, none of these sites are used for commercial or residential purposes. With the possible exceptions of the UR and LR sites, none of the Remaining Phase 1 or Phase 2 sites are subject to frequent noise generated by area roadways.

Residential and commercial development occurs along much of the Trinity River within and adjacent to various Remaining Phase 1 or Phase 2 sites. Numerous public and private river access areas also occur along the river, including the public access areas described in section 4.8, Recreation. Use of these areas typically involves non-motorized recreational activities, which generally involve low noise levels.

To varying degrees, construction vehicles entering and leaving the sites would temporarily increase traffic levels and, thus, ambient noise levels along secondary arterial and collector roads. Homes and commercial developments along these roads may experience some increased ambient noise levels during construction, but in general, noise levels would be buffered somewhat by topography and vegetation.

Currently, ambient noises such as river flow and those generated as a result of recreational use are the primary sources of noise encountered at these sites. Lands adjacent to most of the sites are largely undeveloped and the majority of nearby roads are less traveled than the region's state routes and larger arterial roadways. Noise generated by vehicle use on these roads is generally the result of resident and recreational traffic (e.g., OHVs, fishermen, and rafter access).

A community noise survey was conducted in Trinity County in 2002 (Brown-Buntin 2002) as part of the update currently in progress for the noise element of the County's General Plan. The two survey points established in Lewiston were located at (1) 307 2nd Avenue (approximately 0.5 mile east of the Trinity River) and (2) Lewiston Road (approximately 1.2 miles south of the Bucktail River Access). The community noise survey results indicate that typical noise levels in noise-sensitive areas range from approximately 44 to 52 dB Ldn[1]. These are low noise levels and are representative of small communities

[1]dB L_{dn} = The average equivalent sound level during a 24-hour day, obtained after addition of 10 A-weighted decibels to sound levels in the night after 10:00 p.m. and before 7:00 a.m. A-weighted decibels, abbreviated dBA, or dBa, or dB(a), are an expression of the relative loudness of sounds in air as perceived by the human ear.

and rural areas. Maximum noise levels observed during the survey were generally caused by local automobile traffic or heavy trucks. Other sources of maximum noise levels included occasional aircraft and construction activities. Background noise levels in the absence of these maximum-noise generating sources are largely attributable to distant traffic, water, wind, livestock, birds, and insects.

Sensitive Noise Receptors

Sensitive receptors are specific geographic points, such as schools, residences, commercial areas, or parks, where people could be exposed to unacceptable levels of noise. Noise-sensitive receptors that have been identified in the general vicinity of the project site boundaries include private residential areas; commercial enterprises; persons, primarily recreationists (e.g., hikers, picnickers, anglers, and rafters); and wildlife that use the Trinity River corridor. Noise tolerance levels for these groups are subjective, varying widely between individuals.

Stationary sensitive receptors are located throughout the river corridor, including a number of the rehabilitation sites. Residential areas scattered along both banks of the Trinity River are subjected to varying degrees of ambient noise levels from the river (including recreationists) and intermittent traffic using county arterial and secondary roads in the project vicinity. However, distance, topography, and vegetation often serve as noise buffers for these sensitive receptors.

Wildlife that use the project sites are also considered sensitive noise receptors. Bear, deer, foxes, and raccoons are among the common terrestrial species known to forage and hunt along the banks of the Trinity River. Bats may be present in nearby structures, including residences, trees, and bridges, and avian species such as bald eagles and migratory birds have been observed foraging, roosting, and nesting in or adjacent to the river corridor. The presence of salmonids in the Trinity River is an integral part of Trinity County’s economy. Land- and/or water-based noise sources influence the habitation and travel behaviors of terrestrial and aquatic wildlife.

4.14.2 Environmental Impacts and Mitigation Measures

Methodology

Since the Proposed Project or Alternative 1 would not result in a noticeable increase in traffic volume, construction-related noise is the focus of this impact analysis. Construction noise impacts are based on an assumed mixture of construction equipment and related noise levels. Noise levels of individual types of equipment as described in Table 4.14-4 are based on industry averages. Assumptions related to construction equipment and industry noise averages were used to evaluate construction-related noise impacts, including noise levels at the nearest sensitive receptors.

Significance Criteria

Based on Appendix G of the CEQA Guidelines (Association of Environmental Professionals 2008) the Proposed Project and Alternative 1 would have a significant direct noise impact if they would result in:

- exposure of persons to, or generation of, excessive ground-borne vibration or ground-borne noise levels;

- a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- a substantial temporary or periodic increase in ambient noise levels in the project vicinity above existing levels; or
- exposure of persons to, or generation of, noise levels in excess of standards established in the Trinity County General Plan Noise Element, or applicable standards of other agencies.

Impacts and Mitigation Measures

Table 4.14-5 summarizes the potential noise impacts resulting from implementation of the No-Project Alternative, Proposed Project, and Alternative 1.

Table 4.14-5. Summary of Noise Impacts for the No-Project Alternative, Proposed Project, and Alternative 1

No-Project Alternative	Proposed Project	Alternative 1	Proposed Project with Mitigation	Alternative 1 with Mitigation
Impact 4.14-1. Construction activities associated with the project would result in noise impacts to nearby sensitive receptors.				
No impact	Significant	Significant	Less than significant	Less than significant

Impact 4.14-1: Construction activities associated with the project would result in noise impacts to nearby sensitive receptors. *No impact for No-Project Alternative; significant impact for Proposed Project and Alternative 1.*

No-Project Alternative

Under the No-Project Alternative, no change in ambient noise levels would occur because the project would not be constructed. Therefore, there would be no impact.

Proposed Project and Alternative 1

During the construction phase of the project, noise from construction activities would temporarily dominate the noise environment in the immediate area. As shown in Table 4.14-3, construction activities would generate maximum noise levels ranging from 65 to 84 dBA at a distance of 50 feet, although intervening terrain and vegetation could reduce these noise levels. Construction noise would be temporary and is expected to occur over 5–10 years, primarily between the months of July and December. However, coarse sediment management activities may occur as early as February. There would be no permanent noise impacts resulting from implementation of either action alternative.

Residences and commercial enterprises are scattered along both sides of the river throughout the river corridor and would be subjected to varying degrees of construction noise under either action alternative.

Both the Proposed Project and Alternative 1 would make use of existing access roads, although some rehabilitation sites may require the construction of new access roads to allow equipment access into proposed activity areas.

Recreational users in the general vicinity of the Remaining Phase 1 or Phase 2 sites could encounter increased ambient noise levels during construction activities. While such an increase in noise would be significant, its impact would be temporary and localized.

Under either of the action alternatives, it is not anticipated that ground vibration created by project activities would be detectable at any sensitive receptor location and would not result in any structural damage. Although the activities allocated with either alternative would be short-lived and occur periodically, this impact would be significant.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

4.14-1a Construction activities near residential areas would be scheduled between 7:00 a.m. and 7:00 p.m., Monday through Saturday. No construction activities will be scheduled for Sundays or other hours and days established by the local jurisdiction (i.e., Trinity County). The contractor may submit a request for variances in construction activity hours, as needed.

4.14-1b Reclamation will require that all construction equipment be equipped with manufacturer's specified noise muffling devices.

4.14-1c Reclamation will require placement of all stationary noise-generating equipment as far away as feasibly possible from sensitive noise receptors or in an orientation minimizing noise impacts (e.g., behind existing barriers, storage piles, unused equipment).

Significance after Mitigation

Less than significant

SECTION 4.15

Public Services and Utilities/Energy

4.15 Public Services and Utilities/Energy

This section describes the public services and utilities in Trinity County and evaluates potential impacts on these resources from implementation of the Proposed Project and its alternatives at the Remaining Phase 1 and Phase 2 sites.

4.15.1 Environmental Setting

Regional Setting

Water Supply and Distribution

Community service districts provide service to several communities in Trinity County, including Weaverville, Lewiston, and Hayfork. In some instances, local service districts provide water service to small residential areas. Outside these communities, a large portion of the county's population is served by onsite water developments. These developments include wells, springs, and surface intake facilities along the Trinity River and its tributaries.

Surface Water

Surface water is provided by pumps and stilling wells in the Trinity River and its tributaries, and by developed springs throughout the area. Surface water is primarily used for domestic purposes, including incidental use for gardens, livestock, and fire protection.

Groundwater

Recent alluvium formations are the predominant fresh water-yielding formation along the Trinity River. These formations underlie the rehabilitation sites at varying depths. Water quality is highly variable and depends on local geologic features. The most common potential hazards to groundwater quality in Trinity County involve concentration of nitrates and dissolved solids from agricultural practices and septic tank failures. Ground water is primarily used for domestic purposes, including incidental use for gardens, livestock, and fire protection. Additional information on this subject is provided in sections 4.3, Geology and 4.4, Water Resources.

Water Treatment Facilities

Water treatment facilities vary widely throughout the county. Water treatment facilities serve portions of the Lewiston, Douglas City, Weaverville, and Hayfork communities, and operate in accordance with established EPA guidelines. The Weaverville Community Services District (WCSD) and Lewiston Mutual Water Company use water obtained through subsurface infiltration mechanisms on the Trinity River near the confluence of Weaver Creek and Deadwood Creek respectively. Water supplies that serve small subdivisions and private residences often have filtration and treatment systems that are used to address local water quality concerns.

Wastewater Collection and Treatment

Trinity County has very limited wastewater collection and treatment facilities. Community wastewater collection and treatment facilities serve portions of Weaverville, Hayfork, and Lewiston. Individual, on-site septic tanks and drainage fields are used throughout most of the county. The ability of the land to accommodate on-site sewage disposal systems varies considerably throughout the county. Problem sites generally have one or more of the following constraints: high groundwater, steep slopes, shallow soils, mine tailings, or high clay content.

Gas Supply and Distribution

Natural gas providers do not serve Trinity County. Liquefied propane gas and kerosene fuels are provided to residents on a case-by-case basis through distributors based in Weaverville, Hayfork, and Redding.

Solid Waste Collection and Disposal

Trinity County does not operate a solid waste landfill, but does operate several transfer stations that collect residential, commercial, and industrial refuse; green waste; recyclables; and household hazardous waste. All materials collected at the county transfer stations are transported to the Anderson-Cottonwood Disposal Service landfill in Anderson, California. Several independent private companies provide subscription garbage collection service to residents of Trinity County.

Law Enforcement

The Trinity County Sheriff's Department (TCSD) provides law enforcement for the entire county. The TCSD headquarter is located in Weaverville, and a substation is located in Hayfork. Resident officers are stationed throughout the county and serve as the primary contact point for local communities.

The California Highway Patrol (CHP) operates from an office in Weaverville and serves as the primary law enforcement agency for state facilities and transportation corridors. The CHP works closely with the TCSD to provide law enforcement coverage to Trinity County.

The BLM and the USFS provide law enforcement in association with their land management activities. Although the focus of BLM and USFS officers is actions on public lands, they work closely with other agencies to provide law enforcement support throughout Trinity County. In addition, the CDFG has wardens in Trinity County who also provide law enforcement coverage in association with their fish and wildlife protection responsibilities.

Fire Protection/Emergency Services

Sixteen volunteer fire departments are located throughout Trinity County. These departments work closely with the Cal Fire and the USFS to meet Trinity County fire protection needs. The volunteer fire departments are responsible for structural fire protection and rescue services in Trinity County throughout the year. They are located in the communities of Douglas City, Post Mountain, Hayfork, Wildwood, Junction City, Hyampom, Lewiston, Trinity Center, Coffee Creek, Salyer, Hawkins Bar, Weaverville, Southern Trinity, Downriver, Barker Valley, and Kettenpom-Zenia. These departments currently have a membership of approximately 200 to 225 volunteers. The Trinity Center, Hayfork, Lewiston, and Weaverville departments receive tax revenues to support their organizations, although these revenues are limited. These departments routinely respond outside of their legal boundaries to any emergency to which they are dispatched by the 911 center maintained by the TCSD.

By law, Cal Fire is responsible for wildland fire protection on all private lands in Trinity County and is responsible to some degree for BLM lands, and the USFS is responsible for wildland fire protection on all National Forest lands. Cal Fire and USFS fire stations are staffed only during the summer fire season, which normally lasts from May to late October. The STNF maintains work stations with seasonal fire staff in Weaverville on SR 299 across from the County courthouse, in Junction City directly across from the Junction City Volunteer Fire Department, in Big Bar on SR 299, in Hayfork; and in other rural communities throughout the county. Cal Fire maintains a work station with seasonal fire staff in Weaverville just north of the Weaverville Airport on SR 3.

During the summer fire season, all fire agencies in the county respond to any reported fire, regardless of legal jurisdiction. Cal Fire and USFS are legally and financially responsible for managing wildland fires within their jurisdiction; however, the volunteer fire departments are often the first to respond to wildfires or other incidents, such as traffic accidents. Cal Fire and USFS depend on the volunteer fire departments to provide the initial attack on wildfires, and both agencies have agreements with the volunteer fire departments to reimburse the departments for their assistance.

Medical Services

Medical Services in Trinity County are available at limited locations. Two health clinics run by Trinity County Public Health Department are located in Weaverville and Hayfork. In addition, Mountain Community Medical Services (formerly Trinity Hospital) in Weaverville provides 24-hour emergency services. Trinity Life Support Ambulance and Southern Trinity Area Rescue (STAR) provide ambulance services, while the TCSD maintains a search and rescue team. Due to the limited medical services available in Trinity County, many residents travel west to Humboldt County and east to Shasta County for medical care.

Telephone Service

Trinity County residents receive telephone service through AT&T [formerly SBC] and Happy Valley Phone Company; cellular telephone service is provided primarily by Verizon Wireless and Cal North Cellular. At present, cellular telephone service is limited to select areas (e.g., portions of Lewiston, Douglas City, Weaverville, and Junction City). In some remote areas, satellite service is the only communication option available to customers. Velocity Technology, Inc. provides wireless internet service in the Weaverville Basin, Junction City, Lewiston, Deerlick Springs, Hayfork, and parts of Douglas City. In addition, Humboldt State University in partnership with Redwood Coast Rural Action has created Redwood Coast Connect, a pilot project aimed at making broadband available to rural communities in Trinity, Del Norte, Humboldt, and Mendocino counties.

Electrical Service

Trinity Public Utilities District serves most of the Trinity County population, including residents and businesses in the general vicinity of the rehabilitation sites. Pacific Gas and Electric serves portions of southern Trinity County. Some development in the county is served by individual on-site systems, such as solar power or small hydro-electric systems.

Local Setting

Water Supply and Distribution

Mutual and private water systems, wells, springs, and river intake systems serve development in the Lewiston community. Lewiston has two small water companies that serve the community core area, the Lewiston Park Mutual Water Company and the Lewiston Valley Water Company. Bucktail Mutual Water Company is a community system that serves the entire Bucktail subdivision. Development outside of the Lewiston community core area and Bucktail subdivision relies primarily on individual and shared wells, springs, and river intake systems; several small community well systems are also maintained.

Community and private water systems serve development in the Douglas City community. The WCSD serves several residences and the two mobile home parks in Douglas City. There are 19 connections in Douglas City that serve multiple residences in the mobile home parks and nine additional connections in the Union Hill Road area. BLM's Douglas City Campground is also served with WCSD water. The private water systems consist of individual and shared wells, springs, and river intakes. Surface water, which tends to be less expensive to develop, is more frequently used in this area for domestic purposes than deep wells. A large portion of the Douglas City community (primarily Browns Creek Watershed, Weaver Creek Watershed, and the upper Indian Creek Watershed) falls under a proposal to incorporate Critical Watershed Overlay Zoning to ensure that future land divisions in these areas must develop individual wells. This is to ensure adequate surface water for a variety of existing uses.

Mutual and private water systems serve the Junction City community. No community water systems exist in Junction City. The private water systems consist of individual and shared wells, springs, and river intakes. BLM operates a water system that provides potable water to the Junction City Campground.

Surface Water

The Trinity River and its tributaries are the primary surface water features in the project area. The Trinity River, which bisects the project area, is subject to dramatic changes in flow on a reoccurring basis. A number of residents use water from the Trinity River, either through direct intakes or stilling wells that intercept shallow subsurface flow adjacent to the river. These developed sources are typically located in the active channel or floodplain and require a collection system, pump, and distribution system to service individual residences. The TRRP has been working with land owners along the Trinity River to relocate surface intake systems to preclude impacts related to post-ROD flows and other TRRP activities. To date, the agency has assisted 75 landowners and has another 40 enrolled for upcoming assistance under the auspices of the TRRP Water and Sewage assistance program (*http://www.trrp.net/implementation/infrastructure.htm#ap*).

Groundwater

Groundwater wells provide water for domestic and commercial purposes adjacent to the project area. Due to the location and nature of the terrain, groundwater levels respond generally to river stage. As noted above, geologic investigations conducted for the project suggest that groundwater levels fluctuate seasonally with river flows. Some local domestic water sources collect water via infiltration of surface (river) water rather than tapping underground aquifers. Other domestic water sources collect groundwater from deep wells. All activity areas established within the Remaining Phase 1 and Phase 2 sites were located to avoid surface intakes and other water developments.

Wastewater Treatment and Collection

No public wastewater collection and treatment systems are available to residents in the area encompassed by the various sites. Two private community wastewater collection and treatment systems, located in the Lewiston community core area, serve residents living near the SM site.

Individual and on-site septic tanks and drain fields are the primary methods of wastewater treatment and collection near the Remaining Phase 1 and Phase 2 sites. This method generally provides adequate treatment at a local scale. The ability of the land to accommodate on-site sewage disposal systems varies considerably throughout the river corridor. The performance of these systems is often constrained by decomposed granite soils, high groundwater, steep slopes, shallow soils, mine tailings, or high clay content soils. Due to the reliance on individual onsite sewage disposal systems and the importance of protecting water quality, densities in these riverbank communities are fairly low.

Of continuing concern to the Trinity County Health Department is development within floodplain areas or on extensively mined areas. Previously created lots located within floodplain areas are often constrained by lack of soils (in mined areas), high groundwater, and insufficient area to allow for proper sanitary setbacks from watercourses and wells.

Solid Waste Collection and Disposal

Solid waste collected from the rehabilitation sites and the surrounding areas would be transported by truck either to the Weaverville transfer station or to the landfill located in Anderson, California.

Fire Protection

Cal Fire has identified the lands in the general vicinity of the Trinity River corridor as high fire hazard areas. The rural character of these communities and limited fire station locations result in relatively slow response times, particularly during the winter. During the summer, a USFS helicopter and five-person crew are available during daylight hours. During daylight, Cal Fire also can provide automatic dispatch of a fire retardant bomber and lead plane from Redding. Fire lookouts (Weaver Bally, Hayfork Bally, Bully Choop, and Bonanza King) allow for quick fire detection throughout the plan areas.

The Lewiston Community Services District (LCSD) provides fire protection for the area surrounding the Remaining Phase 1 and Phase 2 sites in the vicinity of Lewiston. LCSD maintains three engines, a rescue vehicle, and an ambulance at its Texas Street station and responds to fires and aid calls year-round. The station has a 23-person volunteer crew and chief. LCSD crews respond to approximately four structure fires (not including flue fires) and 10 wildland fires a year.

The Douglas City Community Volunteer Fire Department (DCCVFD) provides fire protection services for the area surrounding the Remaining Phase 1 and Phase 2 sites in the vicinity of Douglas City. The DCCVFD is the primary fire protection agency for structural fires; it maintains a fire station in the Douglas City community core area with two engines and a quick response vehicle with a 200-gallon slip-on tank. The DCCVFD maintains a second fire station in the Poker Bar-Vizhum Grade area that is supported by volunteers from the local response area. This station has one engine and a service truck.

The Junction City Volunteer Fire Department (JCVFD) provides fire protection services for the area surrounding the Remaining Phase 1 and Phase 2 sites in the vicinity of Junction City. JCVFD crews are the primary responders to vehicle accidents, structure fires, and wildland fires on a year-round basis. The JCVFD maintains three fire engines, a rescue vehicle, and a water tender.

Cal Fire and USFS provide additional fire protection services throughout Trinity County. Cal Fire is the primary fire protection agency for wildland fires in Lewiston and Douglas City. Its coverage of the community plan areas varies by season. During the winter, Cal Fire responds from Weaverville with one engine, if personnel are present. In the summer, Cal Fire is equipped to provide three engines with 2,250 gallons of water and 12 to 13 fire fighters; two engines respond from Fawn Lodge, and another engine can respond from Weaverville. Minimum response time in these areas is 10 to 15 minutes or longer, depending on access (15 to 20 minutes on average). Half of these responses are typically for structure or flue fires and half are for wildland fires. USFS is the primary fire protection agency for wildland fire in Junction City due to the large amount of USFS land in this community.

Schools

There are three elementary schools (Lewiston Elementary, Douglas City Elementary, and Junction City Elementary) consisting of grades kindergarten through eight in the vicinity of the Remaining Phase 1 and Phase 2 sites. These elementary school districts provide bus services for residents in these communities with the exception of the Junction City Elementary School District. Bus service is also provided throughout these communities for students attending Trinity High School in Weaverville.

4.15.2 Environmental Impacts and Mitigation Measures

Methodology

The analysis addresses potential impacts from implementation of activities at the rehabilitation sites on the following public services and facilities: water supply and distribution; wastewater collection and treatment, law enforcement, solid waste collection and disposal, fire protection, telephone service, electric service, and schools. The analysis qualitatively addresses potential impacts on energy resources resulting from substantial or wasteful energy use during project construction. The analysis is based on a review of planning documents applicable to the Remaining Phase 1 and Phase 2 sites, communications with various agencies, and field reconnaissance.

Significance Criteria

A project would normally have a significant impact on public services or utilities under CEQA if it would

- not comply with published national, state, or local statues, regulations, or standards relating to solid waste;
- interfere with emergency services;
- degrade the level of service of a public service or utility;
- require relocating infrastructure;
- result in substantial adverse physical impacts associated with the provision of, or need for, new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios; response times; or other performance objectives for fire protection, police protection, schools, parks, or other public services;
- require substantial improvements to the infrastructure or level of staffing of a public service or utility to maintain its existing level of service;
- require or result in the construction of new water treatment, wastewater treatment, or storm water drainage facilities, or the expansion of such existing facilities, the construction of which could cause significant environmental effects;
- be served by a landfill without sufficient permitted capacity to accommodate the project’s solid waste disposal needs;
- disrupt utilities service to create a public health hazard or extended service disruption; or
- encourage activities that result in the use of large amounts of fuel or energy, or would use fuel or energy in a wasteful manner.

Impacts and Mitigation Measures

Table 4.15-1 summarizes the potential impacts on public services and utilities that could result from implementation of the project.

Table 4.15-1. Summary of Public Services and Utilities Impacts for the No-Project Alternative, Proposed Project, and Alternative 1

No-Project Alternative	Proposed Project	Alternative 1	Proposed Project with Mitigation	Alternative 1 with Mitigation
Impact 4.15-1. Implementation of the project could disrupt existing electrical and phone service during construction activities.				
No impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]
Impact 4.15-2. Construction of the project could result in the generation of increased solid waste.				
No impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]
Impact 4.15-3. Implementation of the project could result in disruption to emergency services, school bus routes, or student travel routes during construction activities.				
No impact	Significant	Significant	Less than significant	Less than significant
Impact 4.15-4. Construction of the project could result in a substantial use of nonrenewable energy resources.				
No impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]

[1]Because this potential impact is less than significant, no mitigation is required.

Impact 4.15-1: Implementation of the project could disrupt existing electrical and phone service during construction activities. ***No impact for the No-Project Alternative; less-than-significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, no construction-related disruption to existing electrical or telephone service would occur because the project would not be implemented. Therefore, there would be no impact.

Proposed Project and Alternative 1

Under either the Proposed Project or Alternative 1, no activities would occur to disrupt electrical or telephone service within or adjacent to the Remaining Phase 1 and Phase 2 sites. Utility poles and/or underground lines located in the boundaries of these sites have been identified, and activities described in Chapter 2 have been designed to avoid impacts to these facilities. There are also a number of electrical and phone lines that cross roads used to access the sites. The fire code requires adequate clearance for phone lines and utility lines. These clearances should be adequate to allow access by construction equipment. Therefore, the impacts on utilities associated with these sites as a result of the Proposed Project or Alternative 1 would be less than significant.

Mitigation Measures

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.15-2: **Construction of the project could result in the generation of increased solid waste.** ***No impact for the No-Project Alternative; less-than-significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Increased quantities of solid waste would not be generated under the No-Project Alternative because there would be no construction activities. Therefore, there would be no impact.

Proposed Project and Alternative 1

Under either the Proposed Project or Alternative 1, construction would result in the generation of solid waste associated with the removal of substantial amounts of vegetation and other construction-related waste (e.g., garbage, cans, buckets, and oil). Vegetative materials (e.g., stumps, roots, and branches) would be disposed of within the site boundaries. Disposal methods would include vegetative chipping to provide mulch, burial, piling to provide wildlife habitat on site, burning, or being left in the floodplain to provide structural habitat for juvenile fish. Solid waste generated by construction activities would either be disposed of at one of the local transfer stations (Weaverville or Junction City) or transported by truck to a landfill located in Anderson, California. The Anderson landfill currently has sufficient capacity and the necessary permits to accommodate non-hazardous construction waste.

The contractor would be responsible for determining appropriate disposal sites for any hazardous waste. Disposal of potentially hazardous waste is evaluated in section 4.15, Hazardous Materials.

Temporary access routes built for project implementation would be closed and/or decommissioned to ensure that the number of access points on public lands would not increase the requirement to provide public services (e.g., solid waste disposal) at locations that are inconsistent with agency guidelines and policies.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significant after Mitigation

Not applicable

Impact 4.15-3: Implementation of the project could result in disruption to emergency services, school bus routes, or student travel routes during construction activities. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Because there would be no construction activities associated with implementation of the No-Project Alternative, there would be no disruption to emergency services, school bus routes, or student travel routes. Therefore, there would be no impact.

Proposed Project and Alternative 1

Activities associated with either the Proposed Project or Alternative 1 would be confined to the site boundaries described in Chapter 2. Traffic control associated with project activities would be minimal and would cause only brief short-tem disruptions. In addition, construction personnel and service vehicles would use designated routes to and from the Remaining Phase 1 and Phase 2 sites. However, access for mobilization and demobilization of heavy equipment may require temporary traffic control for local roadways before, during, and after site construction. Therefore, this would be a significant impact.

No road/bridge closures are planned; however, in the event that it becomes necessary to temporarily close a road or bridge as a result of project activities, the road/bridge closures would be implemented during non-peak hours to avoid traffic circulation impacts associated with emergency services and school bus services. A closure, even during non-peak hours (11:00 p.m. to 6:00 a.m.) could have the potential to increase significantly response time for law enforcement, fire protection, and other emergency services. Therefore, this would be a significant impact.

In the event that road closures would be required during the school year (mid-August through mid-June) the closures could delay students. While the impact would be temporary, it could interfere with student access to bus services and school attendance. Therefore, this impact would be significant.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

4.15-3a Reclamation will require that staging and construction work, including temporary road or bridge closures occurs in a manner that allows for access by emergency service providers.

4.15-3b Reclamation will provide 72-hour notice to the local emergency providers and affected users prior to the start of temporary closures.

4.15-3c Reclamation will coordinate road closures occurring during the school year (mid-August through mid-June) with the appropriate school districts to avoid disruption of school attendance and student access to bus service.

Significance after Mitigation

Less than significant

Impact 4.15-4: Construction of the proposed project could result in a substantial use of nonrenewable energy resources. ***No impact for the No-Project Alternative; less-than-significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

No use of nonrenewable energy resources would occur under the No-Project Alternative because construction activities would not occur. Therefore, there would be no impact.

Proposed Project and Alternative 1

Energy expenditures associated with construction under either the Proposed Project or Alternative 1 would include both direct and indirect uses of energy. Combustion of the refined petroleum products needed to operate construction equipment would be part of that direct energy use. Indirect energy use typically represents about three-quarters of total construction energy usage, with direct energy use comprising the remaining quarter. Though construction energy would be consumed only during the construction phase, it would represent an irreversible consumption of finite natural energy resources.

Construction would consume fuel and electricity, along with indirect energy for materials used in construction. Fuel would be consumed by both construction equipment and construction-worker vehicle trips. Electricity would be used by construction equipment, such as welding machines, power tools, and pumps. Energy consumed by power equipment during construction would be relatively minimal.

Construction energy consumption would be a short-term impact and would not be an ongoing drain on finite natural resources. Alternative 1 would use less energy than the Proposed Project during construction activities because overall there would be reduction in the location, type, and extent of construction activities. Construction under either the Proposed Project or Alternative 1 would consume energy primarily in the form of fuel and would not have a significant effect on local or regional energy sources.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

SECTION 4.16

Transportation/Traffic Circulation

4.16 Transportation/Traffic Circulation

This section describes the transportation resources known to occur in the Trinity River basin in proximity to the proposed rehabilitation sites along the Trinity River. It also evaluates potential impacts to transportation resources and traffic circulation from implementation of the Proposed Project and its alternatives.

4.16.1 Environmental Setting

Regional Setting

Regional Roadway Network

The USFS Scenic Byways program was developed to provide alternative uses of national forest lands while meeting the public demand for scenic driving tours on safe, well-maintained roads within or near the boundaries of national forests. Trinity County currently has two Scenic Byways, the Trinity Scenic Byway along SR 299 and the Siskiyou-Trinity Scenic Byway along SR 3 and SR 36. SR 299 was designated the Trinity Scenic Byway in October 1991. It enters Trinity County from the east over Buckhorn Summit, descending toward the Trinity River at Douglas City. Following Weaver Creek to Weaverville and then climbing Oregon Mountain, it rejoins the river at Junction City and follows the Trinity River into Humboldt County. SR 3, historically called the Trinity Heritage Scenic Byway, has recently been renamed the Siskiyou-Trinity Scenic Byway. It extends south from Montague in Siskiyou County through the Scott River Valley and enters Trinity County over Scott Mountain 55 miles north of Weaverville. It bisects the Trinity Alps, past Trinity Lake before continuing on to Weaverville, then south through Hayfork to the end of the highway at its junction with SR 36. This scenic byway continues along SR 36 through Forest Glen before continuing into Humboldt County.

Local Setting

The Lewiston community is a collection of residential and commercial areas accessed by Trinity Dam Boulevard, Lewiston Road, and Rush Creek Road. These roads connect to either SR 3 or SR 299, and provide access from several directions to the area encompassed by the Lewiston Community Plan. Rush Creek Road, Lewiston Road, Browns Mountain Road, and Goose Ranch Road are all located near the Remaining Phase 1 and Phase 2 sites and would provide access to one or more sites located in the general vicinity of Lewiston. Trinity Dam Boulevard, Rush Creek Road, and Brown's Mountain Road provide access to residential areas and federal and private timberlands. Lewiston Road provides access to residential, resource, and commercial areas, and Goose Ranch road provides access to residential areas. These roads are part of the Trinity County road system. The development pattern in the vicinity of Lewiston includes a number of private roads maintained by individuals or associations. Salt Flat Road is an example of a private road that provides access to a number of residences on the right bank of the Trinity River, downstream of Rush Creek. Public access is often restricted by private land owners.

The residential development known as Poker Bar is located between Lewiston and Douglas City. The primary access to this development, Poker Bar Road connects to SR 299 several miles downstream from the junction of Old Lewiston Road and SR 299. In addition to Poker Bar Road, a number of private roads provide access to residents along the Trinity River. Public access is often restricted by private land owners.

The Douglas City community is a collection of residential and commercial areas connected by SR 299 and SR 3. Steiner Flat Road, Riverview Road, Union Hill Road, and Steel Bridge Road are all located in the vicinity of the Remaining Phase 1 and Phase 2 sites and would provide access to one or more of the sites. Union Hill Road and Steel Bridge Road provide access to residential areas and, to varying degrees, federal and private timberlands. Steiner Flat Road provides access to residential, public services, commercial, recreation, and timberlands. These roads are part of the Trinity County road system. Similar to other communities in Trinity County, there are a number of private roads that serve residences and provide access for forest management activities. Public access is often restricted by private land owners.

The Junction City/Helena community is also a collection of residential and commercial areas connected by SR 299. Sky Ranch Road, Dutch Creek Road, Red Hill Road, and Evans Bar Road are all located in the vicinity of the rehabilitation sites and would provide access to one or more of the rehabilitation sites. Dutch Creek Road, Red Hill Road and Evans Bar Road via Dutch Creek, and Sky Ranch Road provide access to residential areas and federal and private timberlands via SR 299. These roads are part of Trinity County's road system. There are a number of private roads that serve residences and provide access for forest management activities. Public access is often restricted by private land owners.

Table 4.16-1. Roadway Characteristics for Potential Access Roads Serving the Rehabilitation Sites

Road Name	Rehabilitation Site(s)	Owner-ship	Surface Type	Roadway Class	Traffic Counts (ADT)
Trinity Dam Boulevard	Lower Rush Creek (LRC)	County	Paved	Major Collector	441@ Rush Crk; 897 @ 299
Rush Creek Road	Sawmill (SM) Upper Rush Creek (UR) Lower Rush Creek (LRC)	County	Paved	Minor Arterial	409
Lewiston Road	Lowden Ranch (LR)	County	Paved	Major Collector	827
Ponderosa Road	Trinity House Gulch (THG)	Private		Local/ residential	
Goose Ranch Road	Lower Rush Creek (LRC)	County	Paved	Local/ Residential	276

Table 4.16-1. Roadway Characteristics for Potential Access Roads Serving the Rehabilitation Sites

Road Name	Rehabilitation Site(s)	Owner-ship	Surface Type	Roadway Class	Traffic Counts (ADT)
Douglas City Community Plan Area					
Reo Lane	Tom Lang Gulch (TLG)	County	Rock	Local/ Residential	Not Available
Poker Bar Road	Poker Bar (PB) China Gulch (CG)	County/ Private	Paved	Local/ Residential	178
Steel Bridge Road	Steel Bridge Day Use (SB) McIntyre Gulch (MG)	County	Paved	Local/ Residential	177
Union Hill Road	Limekiln Gulch (LKG)	County	Chip seal	Local/ Residential	60
SR 299	Douglas City (DCY)	State	Paved	Highway/ Scenic Byway,	4450
River View Road	Douglas City (DCY) Reading Creek (RC)	County	Paved	Local/ Residential	324
Steiner Flat Road	Reading Creek (RC) Steiner Flat Feather Edge (SFF) Steiner Flat Campground (SFC) Lower Steiner Flat (LSF) Lorenz Gulch (LZG)	County	Paved	Local/ Residential	1290
SR 3	Reading Creek (RC)	State	Paved	Highway	Not Available
Junction City Community Plan Area					
Evans Bar Road	Dutch Creek (DCK) Evan's Bar (EB) Soldier Creek (SCK)	County	Gravel/ chip seal	Local/ Residential	Not available
Sky Ranch Road	Chapman Ranch (CR) Deep Gulch (DG) Sheridan Gulch (SHC) Oregon Gulch (OG) Sky Ranch (SR) Upper Junction City (UJC)	County	Paved	Local/ Residential/ Scenic County Roadway	76

Table 4.16-1. Roadway Characteristics for Potential Access Roads Serving the Rehabilitation Sites

Road Name	Rehabilitation Site(s)	Owner-ship	Surface Type	Roadway Class	Traffic Counts (ADT)
Dutch Creek Road	Evan's Bar (EB) Soldier Creek (SCK) Chapman Ranch (CR) Deep Gulch (DG) Oregon Gulch (OG) Sky Ranch (SR) Upper Junction City (UJC)	County	Paved	Local/ Residential	950@ SR299/ 147@ Red Hill
Red Hill Road	Lower Junction City (LJC) Upper Connor Creek (UCC) Wheel Gulch (WGH)	County	Paved	Minor Collector	822@ Dutch Creek
Hocker Road	Upper Conner Creek (UCC)	Private		Local/ Residential	Not available
SR 299	Sky Ranch (SR) Upper Junction City (UJC) Lower Junction City (LJC) Wheel Gulch (WGH)	State	Paved	Highway/ Scenic Byway	2950 east of Junction City 1900 west of Junction City

Sources: Caltrans Information: http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/2007; Smith, pers. comm. 2008

In addition to using existing roads to access the Remaining Phase 1 and Phase 2 sites, roads within the boundaries of these sites would be used to support various activities. To varying degrees, new roads will be required to provide short-term, and in some instances long-term access for construction and monitoring activities at some sites. The location of the roads (existing and new) associated with the Remaining Phase 1 sites are shown on Figures 2.1a through 2.1f. Details on Phase 2 sites are not available at this stage in the analysis.

Designated Truck Routes

SR 299 is a designated truck route between the Sacramento Valley and the coastal communities of northern California. It is the main access corridor to Trinity County and provides primary access to the Trinity River, including most of the sites in the general vicinity of Douglas City and Junction City. SR 3 will also be used, primarily to access the left bank activity areas at the RC sites. Most of the county and private roads that will be used for access are connected to either SR 299 or SR 3. County roads that would be used to access the Remaining Phase 1 and Phase 2 sites are not designated truck routes.

Public Health

No public health programs or private meals programs for seniors (e.g., Meals on Wheels) or disabled persons currently serve residents in the Lewiston, Douglas City, or Junction City communities.

Bikeways, Pedestrian and Equestrian Circulation

Bicycle, pedestrian, and equestrian circulation is limited in the communities and residential neighborhoods that have developed along the Trinity River below Lewiston Dam. The Lewiston Community Plan contains a goal to provide a pedestrian and bicycle circulation system in the Lewiston community core and Historic District areas. Additionally, a wide shoulder was added to a portion of Rush Creek Road, and is used by pedestrians near the SM and UR sites, including students who walk from connecting roads to bus stops.

The Douglas City Community Plan contains goals to increase bicycle, pedestrian, and equestrian travel in this planning area. These community plan goals have not yet been implemented. However, pedestrians and equestrians use county and private roads that are adjacent to the river for exercise and recreational pursuits including Steiner Flat Road, Riverview Road, Poker Bar Road, Reo Lane, and Steel Bridge Road.

The Junction City Community Plan also contains a goal to increase bicycle, pedestrian, and equestrian travel and safety by developing bicycle routes, trails, and pedestrian walkways. Red Hill Road runs parallel to the Trinity River along the left bank downstream of Canyon Creek. This road was widened by Trinity County to include a bike lane, primarily to provide alternative transportation between local residences and Junction City Elementary School. Although bike lanes are not available on other roads in the general vicinity of Junction City, bicyclists, pedestrians, and equestrians use these roads for access, exercise, and recreational pursuits. Roads that would be used to access Phase 2 sites include Dutch Creek Road, Red Hill Road, Evans Bar Road, Sky Ranch, and Hocker Flat Road. Pedestrians include students who walk from connecting roads to the bus stops along Red Hill Road and Dutch Creek Road.

Parking

In the Lewiston Community Plan area, public parking is available in the vicinity of the various rehabilitation sites including Bucktail Hole River Access, Cemetery Hole River Access, Rush Creek River Access, and adjacent to the Old Lewiston Bridge. There are also a number of informal parking areas near the river where the public can legally park.

In the Douglas City Community Plan area, there is one designated Caltrans park and ride area on the corner of SR 299 and Steiner Flat Road across from the Douglas City Community Volunteer Fire Department. Public parking is also available at a number of campgrounds and day use areas in the vicinity of the various rehabilitation sites along the river, including Steel Bridge Campground and Day Use areas, Indian Creek River Access, Douglas City Campground, and the Steiner Flat Day Use areas.

In the Junction City Community Plan area, designated public parking areas are limited in the vicinity of the rehabilitation sites. However, public parking is available at the Junction City Campground and River Access, Baghdad River Access, and various turnouts within the SR 299 easement adjacent to the river. While undeveloped, the BLM lands in the vicinity of the Dutch Creek Bridge and Sky Ranch Road are used as public parking areas on a reoccurring basis. Several commercial recreational developments in Junction City also offer parking for their customers.

4.16.2 Environmental Impacts and Mitigation Measures

Methodology

A qualitative assessment of traffic impacts was performed, based on the construction procedures and equipment that will be used, local transportation policies, site review of existing conditions, and traffic levels on key roadways.

Significance Criteria

Significance criteria were developed based on Appendix G of the CEQA Guidelines, as well as project-specific issues identified during the scoping process (e.g., access during construction). For the project, significant construction-related impacts would result if the project would

- cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections);
- exceed, either individually or cumulatively, a level of service standard established by the county for designated roads or highways;
- affect the form or function of SR 299, specifically bridges extending over the Trinity River and its tributaries;
- affect the form or function of bridges under the jurisdiction of Trinity County or private parties;
- disrupt existing traffic operations, including vehicular and bicycle traffic;
- significantly degrade the existing conditions of local private roads;
- obstruct access to adjacent land uses, including emergency access;
- affect the operation of the local transit system;
- conflict with adopted policies, plans, or projects supporting alternative transportation;
- pose a safety hazard to motorists, bicyclists, equestrians or pedestrians;
- cause substantial damage to or wear of public and private roadways; or
- reduce available parking capacity.

Impacts and Mitigation Measures

Table 4.16-2 summarizes the potential transportation/traffic impacts that would result from implementation of the project.

Table 4.16-2. Summary of Transportation Impacts for the No-Project Alternative, Proposed Project, and Alternative 1

No-Project Alternative	Proposed Project	Alternative 1	Proposed Project with Mitigation	Alternative 1 with Mitigation
4.16-1. Construction activities would reduce/close existing traffic lanes.				
No impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]
4.16-2. Construction activities would generate short-term increases in vehicle trips.				
No impact	Significant	Significant	Less than significant	Less than significant
4.16-3. Implementation of the project would obstruct access to adjacent land uses.				
No impact	Significant	Significant	Less than significant	Less than significant
4.16-4. Construction activities would increase wear and tear on local roadways.				
No impact	Significant	Significant	Less than significant	Less than significant
4.16-5. Construction activities could pose a safety hazard to motorists, bicyclists, pedestrians, and equestrians.				
No impact	Significant	Significant	Less than significant	Less than significant
4.16-6. Construction activities could affect the form or function of bridges under the jurisdiction of Caltrans, Trinity County, or private parties.				
No impact	Less than significant	Less than significant	Not applicable[1]	Not applicable[1]

[1] Because this impact is less than significant, no mitigation is required.

Impact 4.16-1: Construction activities would reduce/close existing traffic lanes. ***No impact for the No-Project Alternative; less-than-significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, there would be no construction-related reduction or closure of traffic lanes. Therefore, there would be no impact.

Proposed Project and Alternative 1

Project construction activities associated with the Proposed Project and Alternative 1 would be managed to ensure that SR 299, SR 3, and local roads remain open to through traffic. Traffic control may be necessary during the mobilization and demobilization of heavy equipment. No road closures are anticipated; however, in the event that it becomes necessary to close temporarily a road or bridge as a result of project activities, the road/bridge closure would be implemented during non-peak hours to avoid traffic circulation impacts. A closure, even during non-peak hours (i.e., 11:00 p.m. to 6:00 a.m.) could have the potential to significantly increase response times for law enforcement, fire protection, and other emergency services. This impact, for which mitigation is provided, is discussed in sections 4.15, Public Services and 4.13, Hazards and Hazardous Materials. Because traffic control requirements associated with project access roads would be temporary, this impact is considered less than significant.

Mitigation Measures

No-Project Alternative, Proposed Project, Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Impact 4.16-2: Construction activities would generate short-term increases in vehicle trips. *No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1*

No-Project Alternative

Under the No-Project Alternative, short-term increases in vehicle trips would not occur because there would be no construction activities. Therefore, there would be no impact.

Proposed Project

Construction activities associated with rehabilitation activities would require a number of truck and worker vehicle trips on area roads leading to and from the rehabilitation sites. Construction equipment (e.g., large trucks, excavators, and back-hoes) would be mobilized to the rehabilitation sites prior to construction and removed upon completion of construction at each site. Therefore, construction equipment trips would be limited and consist of approximately 2–4 trips per year. During the construction period when the greatest number of workers and trucks would be required, up to 20 construction workers and their vehicles would need access to the site daily. These vehicle trips would be added to area roads on a reoccurring basis for the duration of the activities at a specific site. Consistent with the discussion in section 4.11, Reclamation will encourage efforts to reduce the affects of traffic and transportation-related activities on GHG emissions and global warming. Measures such as the use of car-pooling, minimizing the number of truck trips and consideration of fuel efficient construction and service equipment will be encouraged in Reclamation construction contracts related to the Remaining Phase 1 and Phase 2 sites.

Throughout construction, Reclamation would limit the amount of daily construction equipment traffic by staging the construction equipment and vehicles in the project boundary for the duration of work at each site. Post-construction activities (i.e., revegetation, maintenance, and monitoring) would require intermittent access for 3 to 5 years, depending on the success of natural revegetation. However, as noted in Chapter 2, the transport of materials within and between rehabilitation sites could occur during project construction activities. In some instances, materials may need to be transported to off-site locations in the event that on-site storage/use is not feasible or is cost prohibitive. If necessary, this activity would occur between August 1 and October 15. These activities could generate the equivalent of up to 36 truck loads of material per day from an individual site, which would be potentially significant.

Post-construction sediment management activities (e.g., gravel injection, fine sediment removal) associated with the Proposed Project could occur at a number of rehabilitation sites, primarily upstream of Indian Creek. These activities could generate a significant amount of short-term vehicle trips. It is difficult to determine precisely the amount of gravel that would be needed for gravel injection purposes because the need for gravel injection is based on factors that are unknown at this time (such as future water-year type and resulting Trinity River flows). However, TRRP estimates that up to 15,000 tons of gravel could be hauled to these rehabilitation sites on a yearly basis. This could amount to approximately 600 truck loads and would equal 1,200 truck trips when accounting for travel to and from the sites (numbers are based on 25 ton double loader trucks). Gravels excavated within rehabilitation sites would be used for gravel injection purposes where available, thereby minimizing the amount of trips needed for hauling gravel. While the use of on-site gravels for these activities would minimize the number of truck trips, the amount of trips that could be generated by post construction sediment management activities (such as gravel injection activities) would still be potentially significant, particularly in the general vicinity of Lewiston and Douglas City.

Local roads that could be affected in the general vicinity of Lewiston include Goose Ranch Road, Lewiston Road, Old Lewiston Road, Rush Creek, and Trinity Dam Boulevard. Local roads that could be affected in the general vicinity of Douglas City include Union Hill Road, Browns Mountain Road, Steel Bridge Road, and Steiner Flat Road. Local roads that could be affected in the general vicinity of Junction City include Dutch Creek Road, Red Hill Road, Evan's Bar Road, Sky Ranch Road, and Hocker Flat Road. Project implementation would also result in vehicle traffic on SR 299, and possibly SR 3. A number of private roads adjacent to the river could also be affected by project generated vehicle traffic with the express permission of the land owners.

The existing traffic volumes along SR 299 and SR 3 are moderate. While the potential increase in traffic generated from construction and post-construction activities would be localized and minimized through project design criteria, off-site gravel hauling and gravel injection activities could result in short-term increases in vehicle trips that would be significant.

Alternative 1

Under Alternative 1, the location, number, and magnitude of activities would decrease throughout the 40-mile reach of the mainstem Trinity River. To reduce the impacts, this alternative would limit the types of activities to those that simply removed the riparian berms and reestablished functional side-channels at select locations. This reduction or elimination of some rehabilitation activities would translate to an overall reduction in the volume of excavation (cut/fill) within the rehabilitation sites. It would also result in a decrease in the overall number of roads and staging areas; number of in-channel activities, including crossings; and the overall amount of material that would be transported within or between rehabilitation sites. Although this alternative would result in substantially less vehicle trips relative to the Proposed Project, the impact would be significant.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

4.16-2a Reclamation will post signs during gravel haul activities notifying travelers of trucks entering the roadway. Reclamation will ensure that the gravel trucks maintain a speed limit of 15 mph on residential roads and private roads and operate only between the hours of 7 a.m. and 7 p.m., Monday through Saturday.

Significance after Mitigation

Less than significant

Impact 4.16-3: Implementation of the project would obstruct access to adjacent land uses. *No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.*

No-Project Alternative

Under the No-Project Alternative, access to adjacent land uses would not be affected because no construction activities would occur. Therefore, there would be no impact.

Proposed Project and Alternative 1

As described in section 4.2, land uses in and adjacent to the rehabilitation sites consist mainly of public and private resource lands and private residential areas. Land uses in the Lewiston Community Plan area that are adjacent to the rehabilitation sites include residential, resource, commercial, recreational, and agriculture. As previously described, activities associated with sites in Lewiston would use primary access points on Rush Creek Road, Goose Ranch Road, Old Lewiston Road, Browns Mountain Road, and various private roads.

Land uses in the Douglas City Community Plan area that are adjacent to the sites include residential, resource, commercial, mineral, and recreational uses. Construction activities associated with sites in Douglas City would use primary access points on SR 299, SR 3, Browns Mountain Road, Union Hill Road, Steel Bridge Road, River View Road, Steiner Flat Road, and various private roads.

Land uses in the Junction City Community Plan area that are adjacent to the sites include residential, resource, commercial, recreation, and mineral. Construction activities associated with sites in Junction City would use primary access points on SR 299, Evans Bar Road, Sky Ranch Road, Dutch Creek Road, Hocker Flat Road, and various private roads.

Access to adjacent public and private lands may be restricted if traffic control measures are being used. This would constitute a significant impact. Recreational access to the Trinity River could be restricted to varying degrees within and adjacent to the sites along the river during the construction activities. However, several public access points would be available throughout the reach during the project implementation period, both upstream and downstream. Impacts related to recreational access and other recreational resources are discussed under section 4.8 Recreation.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Proposed Project and Alternative 1

4.16-3a Reclamation will maintain access throughout the construction period for all private residences adjacent to the project boundary and access roads adjacent to the Trinity River.

4.16-3b During the construction phase of the project, Reclamation will limit the amount of daily construction equipment traffic by staging construction equipment and vehicles within the project boundary throughout the work period.

Significance after Mitigation

Less than significant

Impact 4.16-4: **Construction activities would increase wear and tear on local roadways.** ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

Under the No-Project Alternative, there would be no wear and tear on local roadways; therefore, there would be no impact.

Proposed Project

While SR 299 and SR 3 are designated truck routes, the local roads over which the construction equipment must pass are only built to withstand occasional use by heavy equipment and may not be constructed and maintained to support substantial volumes of truck traffic. Numerous local roadways would provide access for construction related activities at the Remaining Phase 1 and Phase 2 sites, including roads owned and maintained by Trinity County, state and federal agencies, and roads under private ownership (See Table 4.16-1 for a summary of local roadways and ownership information). Use of these roads to move construction material to and from the work sites or to supply fuel for equipment left on-site could increase wear and tear on the local roadways, and could result in adverse affects on the road conditions. The degree to which this impact would occur depends on the design (pavement type and thickness) and the existing condition of the road.

Because SR 299 and SR 3 are designed to accommodate a mix of vehicle types, including heavy trucks, the project is not expected to add significantly to roadway wear-and-tear on these highways.

Construction equipment would be staged on-site during construction. Additional truck travel on local and private roads would be required when excavated material is used to replenish river gravel supplies for fisheries purposes. Project planning to use on-site coarse sediment would minimize heavy equipment use on local roads, which are needed to access the majority of the sites. Additionally, trucks carrying heavy equipment or coarse sediment (i.e., gravel) would operate within the legal weight limits as determined by the state. The number and types of activities could require some level of reconstruction at select sites prior to, or upon completion of, the Proposed Project. The level of construction traffic could also require additional maintenance for some road segments in conjunction with various activities. This impact would be significant.

Alternative 1

Under Alternative 1, the location, number, and magnitude of activities would decrease throughout the 40-mile reach of the mainstem Trinity River. To reduce the impacts, this alternative would limit the types of activities to those that simply removed the riparian berms and reestablished functional side-channels at select locations. This reduction or elimination of some rehabilitation activities would translate to an overall reduction in the volume of excavation (cut/fill) within Remaining Phase 1 and Phase 2 sites. It would result in a decrease in the overall number of roads and staging areas; the number of in-channel activities, including crossings; and the overall amount of material that would be transported within or between rehabilitation sites. Although this alternative would result in substantially less wear and tear on local roadways relative to the Proposed Project, this would be a significant impact under Alternative1.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Proposed Project and Alternative 1

4.16-4a Reclamation will perform a pre-construction survey of local federal, state, and private roads to determine the existing roadway conditions of the construction access routes, and will consult with the relevant agencies/private parties about road conditions prior to construction activity and post construction activity. An agreement would be entered into prior to construction that would detail the pre-construction conditions and post-construction requirements for potential roadway rehabilitation.

Impact 4.16-5: Construction activities could pose a safety hazard to motorists, bicyclists, pedestrians, and equestrians. ***No impact for the No-Project Alternative; significant impact for the Proposed Project and Alternative 1.***

No-Project Alternative

The No-Project Alternative would not pose a safety hazard to motorists, bicyclists, pedestrians, or equestrians because there would be no construction activities. Therefore, there would be no impact.

Proposed Project and Alternative 1

Traffic safety hazards could arise for motorists, bicyclists, pedestrians, and equestrians in the vicinity of the construction access routes when heavy construction equipment is entering or leaving a rehabilitation site. Access to the Trinity River through each of the Remaining Phase 1 and Phase 2 sites would be limited to identified routes during construction activities to minimize public exposure to construction traffic. Trucks entering and exiting access roads off SR 299 and SR 3 may pose a temporary hazard to motorists and cyclists using the roadway. Bike lanes exist on Red Hill Road, and pedestrians and equestrians use many of the local roads adjacent to the Trinity River for recreation and exercise. Trucks traveling on these routes would pose a safety hazard to these users. This impact would be limited to brief and intermittent periods. Nevertheless, it is considered significant because it poses a safety hazard to motorists, bicyclists, and pedestrians.

Mitigation Measures

No-Project Alternative

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

Proposed Project and Alternative 1

4.16-5a Reclamation will prepare and implement a traffic control plan that would include provision and maintenance of temporary access through the construction zone, reduction in speed limits though the construction zone, signage and appropriate traffic control devices, illumination during hours of darkness or limited visibility, use of safety clothing/vests to ensure visibility of construction workers by motorists, and fencing as appropriate to separate bicyclists, pedestrians, and equestrians from construction activities.

Significance after Mitigation

Less than Significant

Impact 4.16-6: Construction activities could affect the form or function of bridges under the jurisdiction of Caltrans, Trinity County, or private parties *No impact for the No-Project Alternative; less-than-significant impact for the Proposed Project and Alternative 1.*

No-Project Alternative

The No-Project Alternative would not affect bridges under the jurisdiction of Caltrans, Trinity County, or private parties because there would be no construction activities. Therefore, there would be no impact.

Proposed Project and Alternative 1

A number of bridges would be used to access various rehabilitation sites, including bridges over the Trinity River, Indian Creek, and Canyon Creek. The hydraulic model (HEC-RAS) described in section 4.4 Water Resources has been used to integrate the hydraulic controls established by these constructed features. Modification of the form or function of these structures would not be affected by rehabilitation activities in close proximity to project sites. Therefore, this impact would be less than significant.

Mitigation Measures

No-Project Alternative, Proposed Project, and Alternative 1

No significant impact was identified; therefore, no mitigation is required.

Significance after Mitigation

Not applicable

CHAPTER 5

Cumulative Impacts and Other CEQA Considerations

Chapter 5
Cumulative Impacts and Other CEQA Considerations

This chapter addresses certain statutory considerations, including cumulative impacts, that must be evaluated pursuant to CEQA.

5.1 Introduction

As previously explained, Part 1 of this document functions as a Master Draft EIR, as defined under CEQA (CEQA Guidelines Section 15175 et seq.). Like other types of EIRs, a Master EIR must address certain required subjects.

This chapter addresses the following topics:

- cumulative impacts;
- growth-inducing impacts;
- significant effects, including significant unavoidable effects, significant irreversible environmental changes, effects found not to be significant, and potential impacts of anticipated projects under the Master EIR for which sufficient information is not available;
- mitigation measures proposed to minimize the significant effects and the related Mitigation Monitoring and Reporting Plan; and
- the CEQA findings process.

Some of the analyses provided in this chapter are similar to those required under NEPA. The NEPA-required analyses of cumulative effects and other required topics are provided in Chapter 8 at a project-specific level for the Remaining Phase 1 sites.

5.2 Cumulative Impacts

5.2.1 Regulatory Framework

Under the CEQA Guidelines (Section 15355), the term “cumulative impacts” refers to two or more individual impacts that, when considered together, are considerable or that otherwise compound or increase other environmental effects. Cumulative environmental impacts arise from the incremental impacts of a proposed project when added to other closely related past, present, and reasonably foreseeable future projects. These impacts can result from individually minor but collectively significant projects taking place over time.

The CEQA Guidelines require that the cumulative impacts of a proposed project be addressed when they are expected to be significant (14 CCR 15130(a)). When a lead agency is examining a project with an incremental effect that is not “cumulatively considerable,” the lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.

5.2.2 Methodology

According to the CEQA Guidelines, the cumulative impacts discussion “should be guided by the standards of practicality and reasonableness.” Effects of the project as well as surrounding projects and reasonably foreseeable development in the surrounding area should be considered; however, “[a]n EIR should not discuss impacts which do not result in part from the project evaluated in the EIR” (CEQA Guidelines, Section 15130(a)(1)). When the impacts of a proposed project are beneficial rather than adverse, the EIR need not address adverse effects that might arise due to other projects in the vicinity of the project at issue.

The CEQA Guidelines provides an outline of the necessary elements that constitute an adequate cumulative impacts assessment (Section 15130). Several methodologies are available for assessing cumulative impacts. The assessment in this document uses a modified list method, whereby the impacts of closely related past, current, and reasonably foreseeable future projects and programs are identified and considered on a resource-specific basis, together with the potential impacts of the Proposed Project or Alternative 1. In addition to the non-TRRP projects considered in the cumulative effects analysis in this chapter, it should be noted that the analysis of the effects of the Proposed Project throughout this document is also in some ways a cumulative effects analysis because the Proposed Project is a combination of several individual projects.

The geographic scope of the area examined for cumulative impacts is the Trinity River corridor between Lewiston Dam and the confluence of the North Fork Trinity River at Helena, California, because this is the area designated for river restoration activities under the Trinity River Mainstem Fishery Restoration Project FEIS/EIR (U.S. Department of Interior 2000). Downstream of the North Fork Trinity River, flows in the mainstem Trinity River remain adequate to maintain the alluvial river attributes (see section 4.3 for a description of these attributes) central to restoring the Trinity River fishery. The non-flow measures incorporated into the Flow Evaluation Alternative described in the ROD for the FEIS/EIR are specifically intended to restore the 40-mile reach of the mainstem Trinity River below the TRD.

5.2.3 Related Projects and Programs

This section summarizes the projects and programs that, along with the Proposed Project, could contribute to cumulative environmental impacts in the affected geographic area during the implementation of the Proposed Project or Alternative 1.

Fish Habitat Management

Forty-seven mechanical rehabilitation projects were identified in the FEIS/EIR for the Trinity River Mainstem Fishery Restoration Project (U.S. Department of Interior 2000). The ROD for the FEIS/EIR includes augmentation of coarse sediment, particularly upstream of Weaver Creek, as a critical component in restoring the alluvial form and function of the Trinity River. The Proposed Project encompasses activities at the Remaining Phase 1 and Phase 2 sites described in Chapter 2 of this document.

The TRRP has two distinct program elements: (1) the Rehabilitation and Implementation Group, which is responsible for project development, engineering, and regulatory compliance, and (2) the Technical Modeling and Analysis Group, which is responsible for project development, monitoring, and integrating activities in an adaptive management framework. A number of federal, state, and local participants are involved at both the policy and project level under the auspices of the TMC. Active participants include Reclamation, USFWS, NMFS, USFS, BLM, DWR, CDFG, Trinity County, and the Hoopa Valley and Yurok Tribes. The Regional Water Board has participated by issuing permits for TRRP channel rehabilitation and coarse sediment augmentation projects and by serving as the CEQA lead agency for the Canyon Creek Suite of Mechanical Channel Rehabilitation Projects and for this Master EIR.

To date, four channel rehabilitation projects have been completed by the TRRP at Phase 1 sites: Hocker Flat, Canyon Creek, Indian Creek, and Lewiston-Dark Gulch. The rehabilitation activities proposed in this Master EIR are similar to those described in the NEPA and CEQA documents for the four completed channel rehabilitation projects.

Since July 2006, the STNF, in partnership with Reclamation, has implemented 2 years of sequential coarse-sediment (gravel) augmentation downstream of the TRSSH. This effort introduced 6,000 cubic yards of coarse sediment into the Trinity River upstream of the Sven Olbertson site near the TRSSH. Consistent with the ROD, gravel augmentation is intended to enhance the development of natural channel complexity and to increase habitat for anadromous salmonids.

In addition to the STNF project, the TRRP has been augmenting coarse sediment in the mainstem Trinity River to enhance alluvial processes and provide juvenile and spawning habitat for anadromous salmonids. Since the summer of 2003, the TRRP has placed nearly 18,000 cubic yards of coarse sediment into the river in conjunction with construction of the initial Phase 1 sites. Since 2008, more than 2,300 cubic yards of coarse sediment has been introduced during spring high flows. High-flow augmentation has occurred at the Sven Olbertson and SM sites using techniques similar to those shown on Figure 2.3j.

Although the quantity of fine sediment removed has decreased over time, annual dredging of the upper Hamilton Pond has occurred in most years since 1990. During summer 2007, the TRRP, in cooperation with the Yurok Tribe, dredged the lower Hamilton Pond at the mouth of Grass Valley Creek. This activity removed about 12,000 cubic yards of fine sediment (sand) and restored the capacity of the lower pond.

Infrastructure improvement projects have also been completed during the past 6 years, including replacement or modification of four bridges over the Trinity River between Lewiston and Douglas City to accommodate future ROD flow releases of up to 11,000 cfs (U.S. Bureau of Reclamation 2003). Other examples of completed infrastructure projects include raising roads at Poker Bar, moving a residence out of the floodplain near downstream of Indian Creek, and relocating pumps and pump houses.

Trinity River Mainstem Fishery Restoration Project

The Trinity River, a major tributary of the Klamath River system, has been subject to extensive water supply and delivery development as part of the CVP. Efforts have been underway since the TRD was constructed to mitigate for the adverse effects of its various elements on salmonid habitat. The 2000 ROD (U.S. Department of Interior 2000) mandated a restoration program consisting of "a combination of managed high flow releases, mechanical riparian berm removal, and gravel augmentation to redirect geomorphic processes so that a more complex channel form will evolve, creating the mosaic of aquatic habitats necessary to enhance freshwater salmonid production."

The Trinity River Mainstem Fishery Restoration Final EIS (FEIS) analyzed a broad range of cumulative impacts, including impacts in the Trinity River basin. The discussion of cumulative impacts in Section 4.1 of the Trinity River Mainstem Fishery Restoration Draft EIS/EIR (DEIS/EIR) focused on the managed flow releases, primarily with regard to water supply and power production outside the Trinity River basin. As a programmatic document, the FEIS satisfied the disclosure requirements under NEPA; however, because Trinity County did not certify the EIR portion of the environmental document, the CEQA component of the document cannot serve as a first-tier EIR. The DEIS/EIR, including Section 4.1, is incorporated by reference into this document. A copy of the DEIS/EIR is available at the TRRP office in Weaverville, California.

The DEIS/EIR included a number of related actions in its discussion of cumulative impacts. These actions include:

- implementation of the Central Valley Project Improvement Act;
- State Water Resources Control Board water rights process and implementation of the CALFED Bay-Delta Program;
- deregulation of the electric industry in California;
- changes in demand for agricultural products;
- changes in fisheries management;
- changes in demand/supply for timber products;
- changes in demand for recreational activities in the Trinity River basin not related to the Trinity River and the TRD; and
- changes in Trinity River basin consumptive water use.

While the purpose of the DEIS/EIR was to evaluate alternative methods to restore the Trinity River fishery, the cumulative impacts section of the DEIS/EIR contained a limited discussion of cumulative impacts specific to the Trinity River basin, particularly with regard to non-flow measures (e.g., mechanical channel rehabilitation). Section 4.1.14 of the DEIS/EIR emphasized the reliance on predictive models that forecast conditions in 2020, typically using projections of state-wide population growth and associated demand for CVP water supplies. This section also identified six specific resource issues and discussed their relationship to the Trinity River basin in terms of cumulative impacts. Table 5-1 summarizes this information.

Table 5-1. Issue-Specific Cumulative Impacts Identified in the Trinity River Mainstem Fishery Restoration DEIS/EIR

Issue	Summary Statement
Fishery resources	Cumulatively beneficial impact to anadromous fish production; also recognized a benefit to recreation.
Agricultural land use	No discussion of impacts to land use within the Trinity River basin. Water supply issues were focused on irrigated lands in the Central Valley of California.
Groundwater resources	No discussion of impacts to land use within the Trinity River basin. Groundwater resource issues were limited to the Central Valley of California.
Water quality	Trinity River water temperatures associated with TRD releases are expected to improve (decrease). Temperatures in Trinity Lake are assumed to degrade (increase) under normal and dry conditions due to assumed increases in CVP demands.
Power resources	Power production from the TRD is an integral component of the CVP. The analysis did not identify any relationship between power production and the non-flow measures described in the FEIS.
Recreation	Beneficial recreation impacts and associated economic benefits are expected to occur as a result of increased fish production in the Trinity River. Potential recreational impacts to various CVP reservoirs (e.g., Trinity Lake) are anticipated to be very minor.

A Biological Opinion issued by NMFS (National Marine Fisheries Service 2000) found that the preferred alternative identified in the ROD "is not likely to jeopardize the continued existence of [SONCC ESU] coho salmon" and "is not likely to destroy or adversely modify critical habitat for the [SONCC ESU] coho salmon." The Biological Opinion concluded "that because the expected outcome of implementation of the Proposed Action is greatly improved fish habitat conditions (including necessary coho salmon habitat), the value of critical habitat for both the survival and recovery of SONCC coho salmon will not be appreciably diminished." Additional information on this Biological Opinion is provided in Chapter 3 of this document.

During the TMC technical team's 2007 annual review of TRRP's planned projects, it was determined that in-river work is clearly consistent with the reasonable and prudent measures identified in the Biological Opinion. Consequently, at the request of Reclamation, NMFS amended its 2000 Biological Opinion to clarify its original intent that in-river work required during channel rehabilitation projects such as the Proposed Project and the coarse sediment augmentation projects are consistent with the 2000 Biological Opinion. A copy of the amended Biological Opinion is on file at the TRRP office in Weaverville, California.

Clean Water Act, Section 303(d) Total Maximum Daily Load Requirements

The Trinity River TMDL for sediment and accompanying source allocation in various reaches and tributaries of the Trinity River have been established to comply with Section 303(d) of the CWA because the State of California has determined that the water quality standards for the Trinity River have been consistently exceeded due to excessive sediment. In 2001, the EPA established the TMDL, with assistance from Regional Water Board staff (U.S. Environmental Protection Agency 2001). The primary adverse impacts associated with excessive sediment in the Trinity River pertain to the beneficial uses ascribed to anadromous salmonid fish habitat. Sediment delivery in the mainstem Trinity River watershed inherently has considerable annual and seasonal variability. Due to the variability in terms of magnitude, timing, duration, and frequency, the TMDL and load allocation apply to the sources of sediment using a 10-year rolling average.

EPA identified a number of contributing causes for excessive sediment, including historic mining effects, past road-building activities, and timber-harvesting practices. In its recommendations for TMDL implementation, EPA stated that the sediment reduction levels can be achieved through implementing any combination of restoration practices, improved management techniques, and/or reduction in intensity of timber harvesting and road density. The Regional Water Board is actively participating in early implementation of many of the management recommendations related to timber harvesting practices and roads listed in the TMDL. Regional Water Board staff is in the process of updating the federal timber waiver for the USFS, which addresses sediment control from 70 percent of the basin. Similarly, the Regional Water Board continues to participate in private timber harvest review to improve best management practices and other requirements to minimize sediment discharges.

The TMDL also found that the TRD had greatly contributed to the impairment of the mainstem below Lewiston Dam by reducing bed-mobilizing river flows. The reduction in available coarse sediment upstream of Rush Creek and the significant contribution of fine sediment from Grass Valley Creek have severely affected the sediment flux in the river. These effects are observable as far downstream as the North Fork Trinity River but are now being somewhat reduced via implementation of the ROD (e.g., control of fine sediment at the Hamilton ponds and coarse sediments augmentation). EPA includes in its TMDL implementation recommendations the implementation of the ROD, including the flow regime, mainstem/watershed restoration, and adaptive management. "In order for the TMDL to be fully effective in protecting beneficial uses and attaining water quality standards, the ROD flows and restoration program must be implemented. The ROD flows are intended to achieve several attributes of a healthy alluvial river system that sediment allocations through the TMDL cannot achieve alone. For example, the ROD flows include inter- and intraannual flow variations that mimic the natural snowmelt period. These peak flows are critical to support several river functions including the mobilization of channelbed particles, scour pools, create point bars and connect the mainstem to the floodplain. Such conditions are necessary to support habitat elements for spawning, rearing and migration of salmonids.…Another critical condition that affects beneficial uses in the Upper Middle Area is the deficit of coarse sediment in the uppermost reach (just below Lewiston dam). Both Lewiston and Trinity dam block the mainstem supply of coarse sediment which is needed to support spawning fish below the dam.…Consistent with the Trinity River Restoration Program, EPA is recommending the augmentation of clean gravel in appropriate locations of the upper mainstem at appropriate times of the year to further meet the needs of spawning salmonids in that area" (U.S. Environmental Protection Agency 2001).

EPA specifies that the TMDL sediment allocations will be more effective in supporting beneficial uses if implemented in consort with the ROD flows. Similarly, the ROD flows will be more effective in achieving the river health goals when the TMDL load allocations are implemented. The Regional Water

Board's efforts to facilitate the mechanical restoration component of the ROD through the issuance of a general permit, supported by this document, will constitute another early implementation action for the Trinity River TMDL.

California Coastal Salmonid Restoration Program/Five Counties Salmonid Conservation Program

As a result of the proposed listing under the ESA of the SONCC ESU coho salmon, the counties of Humboldt, Trinity, Del Norte, Siskiyou, and Mendocino joined together to assist in the recovery of coho salmon and, more recently, steelhead. The overall goal of the counties is to address and improve anadromous salmonid habitat as well as conservation and restoration within the five-county area such that the listings do not result in massive economic impacts similar to those that occurred when the northern spotted owl was listed. Significant funding has been or is being provided by NFMS, the State Water Board (Proposition 204 Delta Tributary Watershed Program), CDFG's "For the Sake of the Salmon" program (SB 271), and the California Natural Resources Agency.

In 1997, the CDFG established the Salmonid Restoration Program for coastal watersheds. Initiatives included in this program support watershed planning projects at a local level, coastal salmon and anadromous trout habitat restoration, and improved efforts to manage anadromous salmon. The program included a Salmon and Steelhead Trout Restoration Account, which could be expended on a wide range of issues, including watershed planning, on-the-ground habitat restoration projects, and other projects for restoring salmonid populations. This account also financed a Watershed Restoration and Protection Council that oversees state watershed protection and enhancement activities and directs and develops a Watershed Protection Program to provide for anadromous salmonid conservation.

Trinity County is participating in the Salmonid Restoration Program through the Five Counties Salmon Conservation Program (5C Program). The 5C Program, consisting of Trinity, Del Norte, Siskiyou, Humboldt, and Mendocino counties, is coordinating and prioritizing restoration projects and developing standard practices to prevent degradation of salmonid habitat resulting from county road projects.

The 5C Program has inventoried fish passage barriers at county road crossings and sediment delivery sources along county roads. Priority projects were identified to improve fish passage and reduce sediment delivery to both salmonid-bearing and non-salmonid-bearing streams in the Trinity, Klamath, Eel, Mad, Van Duzen, Redwood Creek, Smith, Gualala, and other major coastal watersheds. Fish barriers have been removed at a rate of five to 10 per year for the last 3 years, and future projects are in the planning and design stage pending funding opportunities.

Hoopa Valley Tribe

Beginning in the 1980s, the HVT conducted watershed assessments on each of the major tributary watersheds to the Trinity River within the Hoopa Valley Reservation. With these assessments on the shelf, the HVT was among the first in the northwest to take advantage of Clinton-era Northwest Forest Plan funding for decommissioning of roads (outsloping, removal of stream crossings, replanting of decommissioned road alignments). Examples of assessment/rehabilitation projects fully implemented prior to 2000 include projects at Mill Creek, Supply Creek, and Tish Tang Creek. The HVT also has an ongoing program involving road and watershed improvement projects that focus on aquatic habitat improvement and sediment source reduction.

Trinity Management Council

An ad hoc committee of the TMC, in conjunction with the TCRCD, identified a list of potential watershed improvement projects for consideration in the TRRP 2009 budget review process. These projects, which are anticipated to be completed by the end of 2010, are intended to decrease sediment delivery to the mainstem Trinity River and are considered from a cumulative perspective:

- Grass Valley and Indian Creek Road upgrade project, TCRCD;
- Dark Gulch sediment basin enlargement, TCRCD;
- Soldier Creek storm-proofing, TCRCD;
- China Gulch-Dutch sediment reduction proposal, TCRCD;
- Junction City fire rehabilitation, TCRCD;
- Democract Gulch Phase II road improvement project, TCRCD;
- Oregon Mt,/Junction Fire riparian treatment, STNF;
- Brown’s Mountain Road, Bucktail culvert replacement, Trinity County;
- Upper Union Hill Road storm proofing, TCRCD;
- Grub Gulch erosion control, TCRCD;
- Union Gulch fish passage, TCRCD; and
- Little Browns Creek migration barrier removal project, STNF.

Western Area Power Administration

The Western Area Power Administration (WAPA) has prepared an EIS to support the construction of the Trinity Public Utility District (PUD) Direct Interconnection Project. The ROD was issued on January 28, 2008 (73 FR 5184). This project is intended to supply the PUD with power from the CVP. This project will require construction of several structures (pads/poles) to support an overhead line spanning the Trinity River near the TRSSH.

5.2.4 Observations and Investigations Related to Initial Phase 1 Projects

This section summarizes information on the physical changes and biological responses that have been observed by representatives of the TMC, including TRRP staff, in response to recently completed channel rehabilitation and sediment management activities. This information is relevant with respect to the No-Project Alternative in terms of recent cumulative changes to aquatic habitat in the 40-mile reach below Lewiston Dam. Due to the similarity of past projects to those described for the Proposed Project and Alternative 1, this information also provides a frame of reference for assessing the cumulative impacts at the appropriate scale, namely, the mainstem Trinity River between Lewiston and Helena.

Channel Morphology

As shown in Table 5-2, the TRRP has expanded the potential habitat available for native anadromous fish by about 86 acres since 2005. This equates to more than 23 miles of additional wetted perimeter accessible to fish and other aquatic organisms during spring high flows in the range of 6,000 cfs.

Table 5-2. TRRP Aquatic Habitat Expansion

TRRP Project	Year Built	Habitat Feature	Surface Area Constructed (Acres)	Wetted Edge Constructed (Miles)
Hocker Flat	2005	Riverine	17.14	2.09
Canyon Creek	2006	Riverine	20.16	5.19
Hatchery Gravel	2006	In-Channel	3.49	1.57
Hatchery Gravel	2005	Riverine	1.35	0.69
Indian Creek	2007	Riverine	21.82	6.68
Lewiston	2008	In-Channel	2.52	1.02
Lewiston	2008	Riverine	8.51	3.36
Dark Gulch	2008	In-Channel	2.09	0.69
Dark Gulch	2008	Riverine	9.15	2.33
		Total	**86.24**	**23.61**

In conjunction with these projects, more than 750 pieces of LWD have been incorporated into these projects in the past 3 years: Canyon Creek—158 pieces, Indian Creek—254 pieces, and Lewiston/Dark Gulch—356 pieces. The increased use of LWD for habitat is a function of available material and validation that LWD provides habitat for juvenile salmonids, as shown on Figure 5.1-a, b.

Since 2006, the TRRP's Technical Modeling and Analysis Group has been implementing the ROD's AEAM program through the Integrated Assessment Plan (IAP). As a framework, the IAP provides a multi-faceted approach to monitoring with respect to changes in physical processes and features and, to varying degrees, biological responses. The following discussion provides a summary of some of the biological responses that have been documented since the channel rehabilitation activities have been implemented at the sites named in Table 5-2.

Aquatic Habitat – Anadromous Salmonids

Prior to the construction of any of the Phase 1 channel rehabilitation projects, the TRRP conducted habitat mapping in the reach between Lewiston Dam and Rush Creek to identify existing habitat for coho salmon. The Sawmill side channel was constructed by CDFG to provide off-channel juvenile rearing areas for hatchery-produced salmonids in conjunction with TRSSH operations in the 1980s. A variety of age classes have been observed in the constructed side channel, and there appears to be spawning based on the presence of young-of-year coho (Nina Hemphill, pers. comm. 2009).

a. **Juvenile coho using habitat provided by Large Woody Debris placed at the Indian Creek Project.**

b. **Mountain yellow-legged frog egg clusters in off-channel habitat constructed at the Bucktail Project.**

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Figure 5.1
Use of Aquatic Habitat at TRRP Phase 1 Sites

Since the initial Phase I projects have been constructed, the TRRP has conducted a pilot study on coho use of constructed riverine features (e.g., side channels, alcoves, and inundated surfaces). Study results indicate that coho (all freshwater life stages) occupy constructed features such as the Sawmill side channel under a wide range of flow conditions throughout the year.

In addition to documentation of coho at the Sawmill side channel, biologists have monitored fish use of constructed riverine features at several Phase 1 sites. Use of the following constructed features has been observed: an alcove and high flow side channel at the Pear Tree site, the floodplain and side channels at the Indian Creek site, the side channel at the Sven Olbertson site, LWD placement along the mainstem in Lewiston and at the Valdor Gulch site, and the side channel at Hoadley Gulch by the Old Lewiston Bridge.

At Valdor Gulch, juvenile salmonids were observed using placed LWD but were not found in adjacent open water habitat during daylight hours. Coho were observed using slow water with overhanging vegetation by the Old Lewiston Bridge during the summer months but were found in the Sawmill side channel during the winter. At the Indian Creek low-flow side channel constructed in summer 2007, biologists monitored juvenile fish use over several months in summer 2008 in conjunction with the controlled releases from the TRD.

At flows of 6,000 cfs in spring 2008, approximately 200 coho fry were counted along a 150-meter segment near the bottom end of the Indian Creek low-flow side channel and adjacent channel surfaces. As the water receded from the annual peak to about 3,000 cfs, the coho fry were observed in low-velocity habitat provided by the alcoves and LWD in the side channel. By July 9, five coho, 159 Chinook, and 46 steelhead juveniles were observed in the lower portion of the side channel. On August 7, one coho, 100 Chinook, 60 steelhead, and 20 brown trout were observed in the lower third of the side channel. On August 27, zero coho, seven Chinook, and nine steelhead were observed in the lower portion of the side channel. In late October, one coho, 232 steelhead, and 148 yearling hatchery Chinook were observed using habitat in the lower portion of the side channel.

As stated earlier in this chapter, more than 20,000 cubic yards of coarse sediment has been introduced into the Trinity River in the past 6 years. Initial monitoring data from 2008 spawning surveys indicate that anadromous salmonids are using the newly created habitat that has developed in response to coarse sediment augmentation efforts in the reach between Lewiston Dam and Rush Creek.

Sediment Regime

The 2000 ROD acknowledges that sediment management in the Trinity River needs to address two size fractions: fine (silt/sand) and coarse (gravel). It also acknowledged the need to manage flows to achieve the desired sediment balance. The following discussion summarizes some preliminary sediment monitoring results and observations provided by technical representatives of the TMC agencies.

Fine sediment loads in the Trinity River have been reduced substantially since the 1980s by watershed restoration activities in the Grass Valley Creek watershed and operation of the Hamilton Ponds at the mouth of Grass Valley Creek. These ponds capture decomposed granite delivered by Grass Valley Creek and have been periodically dredged to maintain trap efficiency. Between 1985 when they were constructed and 2007, a total of at least 240,000 cubic yards of fine sediment has been dredged from the ponds and prevented from entering the Trinity River. This volume is roughly equivalent to the amount of berm material characterized by the HVT in their 2003 geomorphic characterization of the 40-mile reach below the TRD. While the 1999 TRFE Final Report suggested that up to a million cubic yards of fine sediment was stored in riparian berms along this reach, the HVT efforts refined this estimate downward to approximately 260,000 cubic yards using more detailed mapping techniques and site-specific measurements.

As stated earlier in this chapter, a large number of projects have occurred throughout the watershed to reduce the quantity of fine sediment delivered to the Trinity River from other tributary basins downstream of Lewiston Dam. The net impact on fine sediment delivery rates to the Trinity River is difficult to quantify. However, pebble counts and in-channel geomorphic mapping conducted by TRRP staff and representatives of the TMC in 2006, 2007, and 2008 indicate that the fraction of the bed surface covered by fine sediments is generally small (<10 percent). This is in stark contrast to the conditions in the 1960s and 1970s, when substantial sections of the river were entirely covered with fine sediment.

The high-flow releases mandated by the ROD are designed in part to transport downstream as much or more fine sediments than are delivered to the Trinity River from tributary basins. Sediment transport information collected since 2004 at the Douglas City sediment monitoring station, located about 18 miles downstream from Lewiston Dam, suggests that recent high-flow releases are capable of attaining this transport objective.

To date, the sediment budget developed by the TRRP does not incorporate the timing and volume of fine sediment delivered to the Trinity River from Indian Creek and Weaver Creek upstream from the Douglas City gage. However, a progressive shift in the fine sediment bedload rating curves for the Douglas City gage since the 1980s indicates that the quantity of fine sediment stored in the active channel has declined. Bedload sample data indicate that fine sediment transport rates from 2004 through 2007 were up to an order of magnitude smaller than the transport rates at similar flow levels from 1989 through 1991 and approximately 2 orders of magnitude smaller than transport rates prior to 1987.

In addition to managing fine sediment accumulations within the bed and banks of the Trinity River, the ROD requires replacement of the coarse sediment fraction that was flushed from the reaches downstream of the TRD by post-dam flows and replenishing the coarse sediment that will be transported downstream by future ROD flows. This ongoing effort is necessary to reverse armoring of the streambed that occurred following dam closure and to prevent future armoring that could occur with post-ROD flows. In general, failure to replenish mobile sizes of coarse sediment will cause the particles on the surface of the stream bed to become coarser as more and more of the smaller particles are swept downstream. Without replacement, coarse sediment transport rates will decrease because the remaining large surface particles are more difficult to move, and the dynamic alluvial processes that maintain physical habitat will eventually cease.

The TRRP has adopted a restoration approach based on reestablishing the alluvial processes that create and maintain complex physical habitats, which will in turn be used by fish and wildlife species. The primary management actions undertaken to achieve this objective are additions of coarse sediment to the stream channel and high flow releases from Lewiston Dam. Coarse sediment additions are needed to: 1) continuously replenish gravel that will be transported downstream under the ROD flow regime in the future, and 2) replace the cumulative quantity of gravel that has been transported downstream since the early 1960s when Trinity and Lewiston Dams were completed. High flow releases provide the energy to mobilize and redeposit coarse sediments, thereby rebuilding bar and pool topography and promoting channel migration.

The addition of coarse sediment could raise base flood elevations and have negative effects on holding habitat for adult salmonids. Base flood elevations could respond to changes in grade controls that result from construction of bars or riffles at channel rehabilitation or coarse sediment augmentation sites. To assess potential cumulative changes, base flood elevations are evaluated by the TRRP design team using one-dimensional hydraulic models. Designs for specific activities are adjusted to ensure that any project-related increase in base flood elevations are within the limits imposed by FEMA regulations and consistent with Trinity County's ordinances.

Filling of pool habitats is more likely to occur when additions take the form of high-flow injections or when large quantities of sediment are placed in the channel upstream from a pool. The potential for placed coarse sediments to fill pools is evaluated using hydraulic models and standard sediment entrainment thresholds. For example, TRRP staff used both one- and two-dimensional models to evaluate the likelihood that the 2008 high-flow injections at the pools associated with Lewiston and Sawmill sites would adversely affect the holding habitat (pools) immediately downstream from the injection points. TRRP model results indicated that several thousand tons of coarse sediment with the planned size gradation would pass through the pools during a normal-year release. Subsequent observation and survey data validated these model predictions.

Riparian Habitat – Avian Species

Implementation of rehabilitation projects at various Phase 1 and Phase 2 sites, ROD flows, and cumulative alluvial effects are expected to benefit a wide array of riparian-dependent avian species that are known to occur along the Trinity River corridor. The transformation from extensive monotypic single-age riparian habitat to dynamic, structurally and spatially complex riparian habitat is expected to provide a variety of nesting substrates, cover from predators, and diverse and abundant insect prey, seeds, and vegetative forage for the riparian bird community. It is anticipated that a dynamic river system that results in high-quality riparian habitat equal to the current area of homogenous riparian habitat will meet the needs of target wildlife species for successful survival and reproduction.

5.2.5 Specific Cumulative Impact Analysis

This section identifies potential cumulative impacts that are anticipated as a result of implementing the Proposed Project or Alternative 1 in combination with past, present, and reasonably foreseeable future projects for each resource area described in Chapter 4. The discussion identifies resource areas in which the impacts of the Proposed Project, when viewed together with other projects, could contribute to an impact that is "cumulatively considerable" within the meaning of CEQA.

Under the No-Project Alternative, the Proposed Project would not be implemented, and the impacts on the resources discussed in Chapter 4 would be similar to those that have occurred since the construction and operation of the TRD as modified by the ROD. No significant cumulative impacts to any resources are anticipated as a result of the No-Project Alternative. Because the rehabilitation and sediment management activities would not be implemented, no incremental impacts would contribute to a larger cumulative effect. The selection of the No-Project Alternative, however, could limit the ability of the TRRP to achieve the overall restoration goals for the Trinity River. River restoration projects on the Trinity River are improving the river channel and ecosystem, and selection of the No-Project Alternative would mean that such beneficial cumulative effects would not include the contributions of river channel rehabilitation and sediment management activities at the Remaining Phase 1 or Phase 2 sites. Though high flow augmentation would continue at limited sites, the river channel could start to degrade again as gravel augmentation activities would not occur during summer in-river work periods.

Potential cumulative impacts within each resource area resulting from implementation of the Proposed Project and Alternative 1 are discussed below.

Land Use

Implementation of the Proposed Project or Alternative 1, in combination with other related projects, would not have a cumulative impact in terms of planning policies, nor would river rehabilitation and sediment management activities result in cumulative effects in terms of local or federal land use planning policies.

Restoration of river habitat to restore and enhance the salmonid fishery in Trinity County and on federally managed lands is consistent with general land use policies and agency management plans. Implementation of the Proposed Project or Alternative 1 would not interfere with management of the river's floodplain by local, state, and federal agencies. Some activities would be in the floodplain of the Trinity River and subject to jurisdiction of the Trinity County Floodplain Management Ordinance; however, no increase in the 100-year flood limits would occur within the site boundaries.

Completed and foreseeable channel rehabilitation and sediment management activities in conjunction with post-ROD flows could result in unanticipated changes to the bed and banks of the Trinity River in a manner that influences land uses, particularly in terms of improvements like wells and in-river diversions. The TRRP has an ongoing program to address these impacts at site-specific locations with the concurrence of land owners. While this program is primarily intended to relocate existing infrastructure, it also acknowledges that in some instances bio-engineering stabilization measures may be considered as an alternative measure to address existing or unforeseen impacts (e.g., bank erosion).

Mechanical river channel rehabilitation, in combination with other similar projects, is generally compatible with land uses on adjacent lands. Project-related, temporary impacts on the availability of local mineral resources and local access (see sections 4.2 and 4.16) would not be cumulatively considerable. No significant or substantial cumulative land use effects are anticipated to occur under either the Proposed Project or Alternative 1.

Geology, Fluvial Geomorphology, and Soils

No significant cumulative impacts associated with geologic hazards, geomorphic processes, or erosional processes are anticipated to occur as a result of implementation of the Proposed Project or Alternative 1. Appropriate implementation of prescribed mitigation measures would reduce potential impacts to a less-than-significant level.

Short-term erosional aspects would be addressed through implementation of the prescribed mitigation measures in conformance with the Trinity River TMDL. As described in section 4.2, Land Use, TRRP activities, including post-ROD flows, could result in site-specific changes to the bed and banks of the Trinity River downstream of discrete project sites. While these changes could result in a short-term increase in erosion and/or sedimentation at discrete sites, this response would be consistent with the dynamic nature of an alluvial river.

Long-term effects would be generally beneficial. The fluvial geomorphic processes embodied in the Healthy River Attributes would be affected at the local level (i.e., the 40-mile reach of the mainstem Trinity River); however, these effects would not be significant at the cumulative scale.

Implementation of either the Proposed Project or Alternative 1 as mitigated would benefit, rather than adversely affect, geology, fluvial geomorphology, and soils in the long term, in combination with the other related programs and projects described in this chapter; the effect would be cumulatively beneficial. Instead of creating adverse impacts that would compound or exacerbate the adverse impacts of other projects, either the Proposed Project or Alternative 1 would contribute to long-term environmental benefits, including progress in meeting the TMDL sediment requirements for the Trinity River.

Water Resources

No significant cumulative impacts to water resources are anticipated from implementation of either the Proposed Project or Alternative 1. Overall, the increased channel capacity provided by either the Proposed Project or Alternative 1 within the 40-mile reach would reduce flow impacts in conjunction with other flow-impact reduction projects (e.g., elevation and maintenance of infrastructure). Implementation of the Proposed Project in combination with other river rehabilitation and sediment management activities would not have cumulatively considerable impacts on beneficial uses of the river or result in changes in the quantities of water available for any of those uses.

Water Quality

No significant cumulative impacts to water quality are anticipated to occur as a result of implementation of either the Proposed Project or Alternative 1. The TRRP has identified the need to undertake a suite of rehabilitation and sediment management activities throughout the Trinity River basin. Individually, these activities would result in short-term, temporary effects on water quality, as identified in section 4.5, Water

Quality. While some activities may be implemented simultaneously, the intent of the TRRP is to stage these activities, both in terms of timing and locations, in ways that minimize the potential short-term impacts on water quality.

In the event that simultaneous implementation of these activities is required over the course of several years, some level of cumulative degradation of water quality as a result of sedimentation could occur within the Trinity River during the construction and implementation periods. However, implementation of the prescribed mitigation measures, coordinated by the TRRP, would adequately mitigate for potential short-term water quality impacts associated with turbidity, sedimentation, accidental spills, and other potential water quality effects. The cumulative effect of activities proposed under either the Proposed Project or Alternative 1 is considered less than significant because the effects would primarily occur during construction periods and thus would be short-term.

Implementation of either the Proposed Project or Alternative 1 as mitigated would benefit, rather than adversely affect, water quality in the long term, as would most of the other related projects described in this chapter. Instead of creating adverse impacts that would compound or exacerbate the adverse impacts of other projects, either the Proposed Project or Alternative 1 would contribute to long-term water quality benefits.

Fishery Resources

No significant, adverse, cumulative impacts to fisheries resources are anticipated to occur as a result of the implementation of either the Proposed Project or Alternative 1. The Proposed Project is a result of years of legislative direction, legal decisions, scientific study, public involvement, and adaptive management directed toward enhancing and restoring the fishery resources of the Trinity River. The effect of the Proposed Project, in conjunction with other projects and programs, is expected to be beneficial in terms of the rehabilitation of habitat and fisheries resources.

NFMS's 2000 Biological Opinion (National Marine Fisheries Service 2000) acknowledged that simultaneous implementation of these projects and programs may result in short-term loss of aquatic habitat and temporary displacement of aquatic organisms; however, the Biological Opinion stated that the activities would not have a cumulative impact on the SONCC ESU of coho salmon.

Because a primary objective of the TRRP is restoring the form and function of physical processes and riparian communities in the Trinity River basin, the related projects and programs (described above) have a collective purpose of restoring the fishery resources in the Trinity River. Appropriate implementation of prescribed mitigation measures, coordinated by Reclamation and the Regional Water Board, would adequately mitigate for potential short-term impacts associated with removal of vegetation, loss of habitat, effects on wetlands, and short-term degradation of water quality. The cumulative effect of these identified actions within the scope of this analysis is considered less than significant.

Implementation of either the Proposed Project or Alternative 1 as mitigated would benefit, rather than adversely affect, fishery resources of the Trinity River in the long term, as would most of the other related projects and programs described in this chapter. Instead of creating adverse impacts that would compound or exacerbate the adverse impacts of other projects, either the Proposed Project or Alternative 1 would contribute to long-term fishery resources benefits.

Vegetation, Wildlife, and Wetlands

No significant cumulative impacts to vegetation, wildlife, and wetlands are anticipated to occur as a result of implementation of either the Proposed Project or Alternative 1 in combination with other related projects. The Proposed Project is the result of years of legislative direction, legal decision, scientific study, public involvement, and adaptive management that were directed at restoring the physical processes and biological resources of the Trinity River. Because a primary objective of the TRRP is restoring the form and function of physical processes and riparian communities in the Trinity River basin, the projects and programs described above have a collective purpose of restoring the mainstem Trinity River. In the long-term, restoration efforts will benefit wildlife by expanding the amount of riparian habitat.

Simultaneous implementation of these projects may result in short-term, temporary loss of upland, wetland, and riverine features, including Waters of the United States. The effects would be short-term and primarily associated with construction-related activities. Appropriate implementation of prescribed mitigation measures, coordinated by Reclamation and the Regional Water Board, would adequately mitigate for potential impacts associated with these activities (e.g., removal of vegetation, loss of habitat, and impacts on wetlands). The cumulative effect of these identified actions within the scope of this analysis is considered less than significant.

The project as mitigated would benefit, rather than adversely affect, vegetation, wildlife, and wetlands in the long term, as would most of the other related projects and programs described in this chapter. Implementation of either the Proposed Project or Alternative 1 would contribute to long-term ecological benefits in terms of vegetation, wildlife, and wetlands.

Recreation

No significant cumulative impacts to recreational resources are anticipated to occur as a result of implementation of either the Proposed Project or Alternative 1. The projects and programs described above are intended to benefit the aquatic environment and the Trinity River fishery. Benefits to recreational values may be achieved through the implementation of the TRRP over time.

Implementation of the Proposed Project could temporarily disrupt recreational activities such as boating, fishing, and swimming at specific locations on the Trinity River at the Remaining Phase 1 or Phase 2 sites. If other concurrent projects also disrupt recreational activities in the same geographic area and affect the same user groups, then the effects would be cumulative. Although construction activities for the various restoration projects are not likely to occur simultaneously to a substantial degree, TRRP would coordinate with other entities involved in river restoration activities to ensure that recreational opportunities are not simultaneously affected. Implementation of the Proposed Project or Alternative 1 as mitigated would benefit, rather than adversely affect, river-related recreation in the long term, as would most of the other related projects described in this chapter.

Socioeconomics, Population, and Housing

No significant cumulative impacts to socioeconomics, population, and housing are anticipated to occur as a result of implementation of either the Proposed Project or Alternative 1. The related projects and programs described above are intended to benefit the Trinity River fishery, with moderate projected economic and social benefits to the residents and communities along the Trinity River, including short-term demand for construction labor and a potential for moderately increased long-term recreational uses as the fishery responds to various TRRP restoration activities.

Cultural Resources

No significant cumulative impacts to cultural resources are anticipated to occur as a result of implementation of either the Proposed Project or Alternative 1. The focus of the related projects and programs described above is on restoration of the channel and riverbanks of the Trinity River. The floodplain of the river is a dynamic area, and the proximity of anticipated restoration activities to the floodplain reduces the likelihood that cultural resources would be encountered. The PA (Appendix D) described in section 4.10, Cultural Resources, was intended to address multiple elements of the TRRP. Appropriate implementation of prescribed mitigation measures (e.g., surveys of potential impact areas by a professional archaeologist prior to construction, protection of potentially significant cultural sites, and coordination with local tribes), in coordination with the SHPO, would adequately mitigate for potential impacts, including cumulative impacts.

Air Quality

No significant cumulative impacts to air quality are anticipated to occur as a result of implementation of either the Proposed Project or Alternative 1. The NCUAQMD requirements would be addressed by implementation of prescribed mitigation measures.

As explained in section 4.11, Air Quality, either the Proposed Project or Alternative 1 would generate some temporary air emissions because of grading activities; however, these emissions would be too limited to rise to the level of being “cumulatively considerable.” This result is predicted, in part, because the impacts would be temporary; in addition, the projects and programs described in the preceding section are not generating or are not anticipated to generate any long-term air pollutants. Moreover, construction activities associated with these projects and programs are not likely to occur at the same time, and the locations of the activities themselves are generally far enough apart to allow for considerable dissipation and dispersion of construction-related pollutants.

Either the Proposed Project or Alternative 1, in conjunction with the other projects and programs described in preceding section within the Trinity River basin, would contribute cumulatively to global climate change. Thus, the proposed project would contribute to an adverse cumulative contribution to global climate change. While the individual contribution to greenhouse gases that are believed to cause global climate change would be extremely small when considered in the context of the Trinity River basin, not to mention emissions at the state, national or global scale, the seriousness of the issue and need for all projects to address these issues leads to the conclusion that this contribution would be cumulatively considerable. Implementation of the mitigation measures described in section 4.11, Impact 4.11-4, would reduce the cumulative contribution to global climate change to a less-than-significant level.

Aesthetics

No significant cumulative impacts to aesthetics are anticipated to occur as a result of implementation of either the Proposed Project or Alternative 1. The short-term visual effects that would result from the Proposed Project and other restoration and watershed projects in the river corridor are not substantial, and the implementation of the Proposed Project would be consistent with federal and state requirements for Wild and Scenic Rivers and the Trinity County General Plan.

Implementation of the Proposed Project or Alternative 1 would benefit, rather than adversely affect, aesthetics in the long term, as would most of the other related projects described in this chapter. The Proposed Project would enhance vegetative diversity as historic variability in plant species and age class composition is restored. Enhanced vegetative diversity would support the visual objective of maintaining the aesthetic qualities of a free-flowing river within the Wild and Scenic River corridor. Instead of creating adverse impacts, implementation of the Proposed Project or Alternative 1 would contribute to maintaining long-term aesthetic values.

Hazardous Materials

No significant cumulative impacts related to hazardous materials are anticipated as a result of implementing either the Proposed Project or Alternative 1. Grading and sediment management activities associated with the Proposed Project would not involve substantial use, production, or disposal of materials that would pose a hazard to the environment in the affected area of the Trinity River corridor. All activities are intended to minimize potential public health or safety hazards (e.g., fires, accidents) and are specifically designed to ensure that emergency response plans or emergency evacuation plans are not affected.

Noise

No significant cumulative impacts related to noise are anticipated through the implementation of either the Proposed Project or Alternative 1. Reclamation would coordinate the implementation of other restoration projects to ensure that construction noise is minimized through project scheduling.

The noise impacts of the action alternatives would not be cumulatively considerable because the impacts would not compound or exacerbate the noise impacts of the related concurrent or future projects, which are located in areas that are physically separated from the location of the project. Since construction noise is typically a temporary impact, there would not be a cumulative contribution if the project is not constructed simultaneously with other projects. Similarly, because people would not be able to hear noise from more than one of these projects at the same time, the separate noise sources—all of which are temporary—would not contribute to significant, cumulative noise impacts.

Public Services and Utilities/Energy

No significant cumulative impacts related to public services and utilities/energy are anticipated as a result of the implementation of either the Proposed Project or Alternative 1. The rehabilitation activities are designed in ways that ensure that emergency services would not be disrupted; that public services (e.g., school bus routes) would not be adversely affected; and that waste material generated from project activities would be transported appropriately to authorized locations. The Proposed Project (grading and sediment management activities) would not result in the use of substantial amounts of fuel or energy, nor would implementation result in long-term increases in demand for services or use of energy.

Transportation/Traffic Circulation

As explained in section 4.16, Transportation/Traffic, either the Proposed Project or Alternative 1 would generate some temporary construction-related traffic; however, such traffic would not rise to the level of being cumulatively considerable. Traffic increases would be localized and temporary; the related future projects would also tend not to generate any substantial cumulative long-term traffic impacts. Construction activities for all of the various projects are not likely to occur at once, and the locations of the activities themselves are generally far enough apart to make it unlikely that trucks serving one construction location would cross paths with trucks serving a separate location.

No significant cumulative impacts related to transportation/traffic circulation are anticipated through the implementation of either the Proposed Project or Alternative 1. The TRRP will coordinate with appropriate road management agencies to ensure that the mitigation measures prescribed in this document are implemented in a manner that is acceptable to these agencies.

5.3 Growth-Inducing Impacts

This section evaluates the potential for growth that could be induced by implementation of the Proposed Project or Alternative 1 and assesses the level of significance of any expected growth inducement. Under CEQA, growth itself is not assumed to be particularly beneficial, detrimental, or insignificant to the environment. If a project is determined to be growth inducing, an evaluation is made to determine whether significant impacts on the physical environment would result from that growth.

Section 15126(g) of the CEQA Guidelines provides definitions and guidance in determining the growth-inducing impacts of a proposed project. Specifically, a project is defined to be growth inducing if it would:

- accelerate the rate of planned growth,
- remove obstacles to population growth,
- tax existing community service facilities, or
- foster, promote, or sustain economic population growth.

5.3.1 Growth and Development Potential

Trinity County Growth Policies

The Trinity County General Plan (Trinity County 2001) does not describe specific growth policies; however, it establishes general goals and policies related to housing and residential land use. Trinity County policies recognize that more than half of its housing is located in remote, rural areas, where residents exhibit a high level of individual self-reliance in meeting infrastructure needs. County policies recognize that a strong tradition exists of non-involvement of local government in the area of housing and residential development.

Population

Trinity County's population is concentrated in and around the communities of Weaverville, Douglas City, Lewiston, and Hayfork (as described in sections 4.2 and 4.9). The population in the county increased significantly between 1970 and 1980 from 7,615 to 11,858 (a 55 percent increase). Although growth has continued sporadically, the rate of increase has been substantially lower. The population growth rate was furthered by an influx of retirees and of people seeking an alternative lifestyle in the mountains of northern California and a reasonable cost of living.

Vacant Land and Projected Buildout

Approximately 14.6 percent of the land in Trinity County is potentially available for private development. The USFS, the BLM, and various timber production companies manage the balance of the lands within the county. The General Plan identifies 5,517 private parcels as unimproved and potentially available for development, but suggests that the actual number may be significantly lower based on requirements for waste disposal, slope, and water sources.

Trinity County's Constraints to Development

The Trinity County General Plan identifies a number of existing or potential factors that could adversely affect future residential and commercial development. A number of state and local permits and fees are typically required for new developments. Building according to construction standards and compliance with CEQA are also required. Development of the necessary infrastructure to support larger scale residential or commercial uses (i.e., water, sanitation, energy, and access) is typically a challenge for developers throughout Trinity County.

Proposed Land Uses

In general, all parcels within the site boundaries described in Chapter 2 have been fully subdivided to the extent legally possible under current zoning designations; therefore, future rural residential development within the site boundaries is unlikely. Development applications on such parcels would in most cases require discretionary approvals from Trinity County decision makers, such as changes in zone classification and amendments to the General Plan. The parcels are all located adjacent to the Trinity River, and many of them are designated as Flood Hazard and Scenic Overlay zones, making approval for further development difficult. On federal lands within the site boundaries, the STNF, BLM, and

Reclamation manage land uses and activities in accordance with their respective agency planning processes.

5.3.2 Growth-Inducing Impact of the Proposed Project

Implementation of channel rehabilitation activities and sediment management activities at the Remaining Phase 1 and Phase 2 sites would not remove any constraints to development, create new or improved infrastructure, or otherwise create conditions that would induce growth. Several parcels zoned for residential use in the Proposed Project boundaries are currently vacant, and potential development of a single-family residence on such parcels is possible. Such development, however, would not be directly attributable to the Proposed Project. The Proposed Project would improve habitat for anadromous fish and, thus, improve conditions for fishing and recreation; however, the improved fishery resources resulting from implementation of the Proposed Project are not likely to directly or indirectly result in substantial development or population growth. Therefore, implementation of the Proposed Project would not result in a significant growth-inducing impact.

5.4 Significant Effects

CEQA establishes a duty for public agencies to avoid or minimize environmental damage where feasible (CEQA Guidelines Section 15021), and determinations of significance play a critical role in the CEQA process (CEQA Guidelines 15064). As noted at the beginning of this chapter, certain statutory considerations must be evaluated pursuant to CEQA; several of these considerations are related to significance. This section addresses several types of potentially significant effects.

Some of these considerations are similar to those required under NEPA, as discussed further in Chapter 8 (Part 2, the EA/EIR for the Remaining Phase 1 sites). NEPA and CEQA are also briefly compared in Part 2 of this document (section 6.1.3). Under NEPA, there are no specific statutes or regulations that explicitly require that all significant project impacts be avoided or mitigated to a less-than-significant level or that mitigation measures developed as part of an EA be “monitored” to ensure that they are implemented.

5.4.1 Significant Environmental Effects of the Proposed Project

Potentially significant effects have been identified in the areas of land use; geology, geomorphology, soils, and minerals; water quality; fishery resources; vegetation, wildlife, and wetlands; recreation; cultural resources; air quality; aesthetic resources; noise; public services and utilities; and traffic and transportation. These potential effects are discussed in each resource. As part of the environmental impact assessment for each resource area, mitigation measures have been identified that reduce these impacts to less-than-significant levels.

5.4.2 Significant Unavoidable Effects

CEQA (Pub. Res. Code Section 21100(b)(2)(A) requires that an EIR include a statement that summarizes any significant effects on the environment that cannot be avoided if a proposed project is implemented. CEQA Guidelines Section 15126.2(b) states that such impacts include those that can be mitigated but not reduced to a less-than-significant level. When there are significant impacts that cannot be fully mitigated to a less-than-significant level or minimized by changing the project design, the implications of the impacts and the reasons why the project is being proposed must be described.

The environmental analysis conducted for the Proposed Project and Alternative 1 did not identify any effects that, after mitigation, remained significant and therefore unavoidable. As part of the environmental impact assessment for each resource area, mitigation measures have been identified that reduce all impacts to less-than-significant levels.

5.4.3 Significant Irreversible Environmental Changes

CEQA (Pub. Res. Code Section 21100(b)(2)(B) requires that an EIR include a statement that summarizes any significant effects on the environment that would be irreversible if a proposed project is implemented. Similarly, CEQA Guidelines Section 15126.2(c) requires that an EIR must address the significant irreversible changes which would be involved in the proposed project should it be implemented.

The environmental analysis conducted for the Proposed Project did not identify any significant irreversible effects. The mechanical channel rehabilitation and sediment management activities would occur in a highly dynamic, riverine environment. Mechanical changes in the structure of the river channel and riverbank profile are not irreversible changes, nor are changes in the extent or structure of riparian vegetation. Over time, river flows will modify the rehabilitated structure of the channel and redistribute introduced sediment through natural processes. Changes in channel profile, sediment, and riparian vegetation are not irreversible, and such changes are expected to be significant beneficial effects in terms of restoring the river's complex structure and ecology for the benefit of the river's fisheries.

5.4.4 Effects Found Not to Be Significant

Implementation of the Proposed Project or Alternative 1 would result in potential effects that were determined to be not significant. Effects that are not significant would occur in the following resource areas: water resources; socioeconomics, population, and housing; and hazards and hazardous wastes. These potential effects are discussed in each resource section. Because the effects were determined to be less than significant, mitigation measures are not required.

5.4.5 Potential Impacts of Anticipated Projects for Which Sufficient Information Is Not Available

A Master EIR is by definition intended to be used as the basis of environmental review for subsequent projects. The CEQA Guidelines require that the lead agency address in a Master EIR the potential effects of anticipated projects for which sufficient information may not be available to support a full assessment of potential effects (Section 15176). While the anticipated projects under the TRRP are anticipated to be similar in purpose, design, and implementation to the sites addressed in this document, the specific locations and areal extent are not fully defined.

The potential impacts are expected to be similar to those identified in this document. On a site-by-site basis, the effects on specific environmental resources may vary. One advantage of a tiered assessment is that it facilitates adaptive management; as rehabilitation projects are conducted along the mainstem Trinity River, agencies and partners participating in the projects can adapt to observed changes in the physical environment and better predict and mitigate environmental effects in subsequent projects.

5.5 Mitigation Measures Proposed to Minimize the Significant Effects

Under CEQA (Pub. Res. Code Section 21081.6(a) and Guidelines Section 15097), lead agencies are required to adopt a program for monitoring or reporting on the revisions that they required to be made in the project and other measures required to mitigate or avoid significant environmental effects; the purpose of the program is to ensure that those project revisions and measures are implemented.

Mitigation measures have been identified for various resource areas in this Master EIR (and, in Part 2, the EA/EIR). These measures are presented in language that will facilitate establishment of a monitoring and reporting program. Any mitigation measures adopted by the Regional Water Board as a condition of project approval will be included in a Mitigation Monitoring and Reporting Program (MMRP) to verify compliance. The Draft MMRP is included as Appendix E to this document. The approval of such a program will be part of any action taken by the Regional Water Board with respect to the project. When other regional or state agencies subject to CEQA approve portions of the Proposed Project under their own jurisdiction or regulatory power, these “responsible agencies” will be required to adopt their own MMRPs (CEQA Guidelines, Section 15097(d)).

The MMRP will be used by the Regional Water Board along with Reclamation staff, project contractors, cooperating and participating agencies, and monitoring personnel during project implementation. The intent of the MMRP is to ensure the effective implementation and enforcement of adopted mitigation measures and permit conditions. The MMRP will provide for monitoring of construction activities as necessary, on-site identification and correction of potential environmental problems, and proper reporting to Reclamation staff, and as part of TRRP adaptive management.

5.5.1 Responsibilities and Authority

Reclamation will have the primary responsibility for the MMRP. Reclamation and the Regional Water Board will be responsible for the following tasks:

- ensuring that the MMRP is incorporated into the construction bid documents,
- coordinating monitoring activities,

- directing the preparation and filing of compliance reports, and
- maintaining records concerning the status of all mitigation measures.

5.5.2 Mitigation Monitoring and Reporting Program Plan Format

The draft MMRP plan (Appendix E) includes a summary table that identifies the mitigation measures proposed for the Proposed Project, summarized from this document. The mitigation monitoring table includes the following:

- **Mitigation Measure:** presents the mitigation measures identified in this document for a specific impact, along with the number of each measure.
- **Timing:** identifies when the mitigation measures will be implemented.
- **Agency/Development Consultation:** identifies the specific agency or agencies with which coordination is required to satisfy the requirements of the mitigation measure.
- **Verification:** provides checkboxes to be initialed and dated by the individual designated to verify compliance with a specific mitigation measure.

5.5.3 Noncompliance Complaints

Complaints of noncompliance with adopted mitigation measures may be submitted by interested parties, under Reclamation guidelines. Complaints should be directed to Reclamation in written form, providing specific information on the alleged violation. If a complaint is received, Reclamation (and the Regional Water Board, if appropriate) will conduct an investigation and determine the validity of the complaint. If noncompliance with a mitigation measure has occurred, Reclamation (and the Regional Water Board, if appropriate) will take the appropriate action to remedy the violation. The complainant will receive written confirmation indicating the results of the investigation or the final action corresponding to the particular noncompliance issue.

5.6 CEQA Findings and Statements of Overriding Consideration

The CEQA Guidelines (Section 15091) state that “[n]o public agency shall approve or carry out a project for which an EIR has been certified which identifies one or more significant environmental effects of the project unless the public agency makes one or more written findings for each of those significant effects, accompanied by a brief explanation of the rationale for each finding.”

For this Master EIR, if significant effects had been identified that could not be mitigated to levels that are less than significant, the Regional Water Board, as lead agency under CEQA, would need to make written findings for each significant impact identified in this document before it could approve the Proposed Project.

Section 15093(a) of the CEQA Guidelines allows the lead agency to determine whether the benefits of a proposed project outweigh the unavoidable adverse environmental impacts of implementing the project. The lead agency can approve a project with significant unavoidable impacts if it prepares a "Statement of Overriding Considerations" that sets forth the specific reasons for making such a judgment.

Because no significant unavoidable impacts were identified for the Proposed Project, a Statement of Overriding Considerations will not be required.