# Channel Rehabilitation and Sediment Management for Remaining Phase 1 and Phase 2 Sites

## *Volume III: Environmental Assessment/Draft Environmental Impact Report*
## *Part 1: Draft Master Environmental Impact Report*
## *Part 2: Environmental Assessment/Draft Environmental Impact Report*

**June 2009**

***California Lead Agency for CEQA***
North Coast Regional Water Quality Control Board

***Project Proponent and Federal Lead Agency for NEPA***
Trinity River Restoration Program
U.S. Department of the Interior
Bureau of Reclamation

***Federal Cooperating Agencies for NEPA***
Shasta–Trinity National Forest
Bureau of Land Management

***Cooperating Tribal Agencies***
Hoopa Valley Tribe
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Hoopa Valley Tribe
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# Table of Contents

# TABLE OF CONTENTS

## Trinity River Restoration Project
## Remaining Phase 1 and Phase 2 Sites
## Draft Master EIR – EA/Draft EIR

## Volume I

### Executive Summary

### Finding of No Significant Impact

## Volume II

### Draft Master Environmental Impact Report

# Tables

# Figures

# Volume III

## Environmental Assessment/Draft Environmental Impact Report

# Tables

# Figures

# Volume IV

## Appendices

CHAPTER 6

# Introduction to Part 2–Remaining Phase 1 Sites

# Chapter 6

# Introduction to Part 2 – Remaining Phase 1 Sites

## 6.1 About This EA/EIR

### 6.1.1 Purpose of This Part

As explained in Chapter 1, this combined NEPA/CEQA document evaluates the environmental impacts of the proposed channel rehabilitation and sediment management activities at both a programmatic and project-specific level. Part 1 of this document provides a programmatic environmental review of the Remaining Phase 1 sites and Phase 2 sites.

Part 2 of this document, which begins with this chapter, is an EA/EIR for the six Remaining Phase 1 sites. The EA/EIR provides the site-specific environmental analysis necessary for compliance with NEPA and CEQA for these sites and will allow the lead agencies to make the necessary findings concerning whether this document provides adequate environmental review under NEPA and CEQA for the Remaining Phase 1 sites.

### 6.1.2 Relationship to the Master EIR

This EA/EIR for the Remaining Phase 1 sites tiers from the Master EIR assessment in Part 1. Tiering, which is recognized under both NEPA and CEQA, refers to the practice of covering general matters in broader scope environmental documents and focusing subsequent documents on the issues germane to the site-specific actions (40 CFR 1508.28). Tiering is appropriate when a sequence of analysis progresses from a broad, conceptual, or planning-level review over a wide area or program to a project-specific and site-specific analysis.

Tiering helps the lead agencies focus on issues that are "ripe" for decision, while excluding from consideration issues already decided or not yet ripe (CEQA Guideline Section 15385). The general analysis in the broader document is incorporated by reference into the subsequent documents, meaning that the information in the broader document does not need to be repeated in the subsequent documents. This approach facilitates the review of larger issues, such as cumulative effects, while expediting the preparation of subsequent documents by avoiding unnecessary repetition.

This EA/EIR for the Remaining Phase 1 sites tiers from the Master EIR and incorporates the Master EIR in its entirety by reference. This EA/EIR tiers from the Master EIR in terms of each major component of the assessment: the description of the Proposed Project (or proposed action; see section 6.3, below), the programmatic assessment of environmental impacts (or consequences), and the identification of mitigation measures to avoid or reduce environmental effects. Part 2 is focused on the additional site-specific environmental effects of the six Remaining Phase 1 sites not described in the Master EIR.

In addition to information provided in Chapter 2 (Proposed Project and Alternatives) and Chapter 3 (Regulatory Framework), the programmatic analysis provided in Chapter 4 of the Master EIR is also incorporated by reference. Chapter 4 provides the environmental setting, impact analyses, and mitigation measures, as applicable, for each resource topic required in an EIR. To varying degrees, these descriptions and analyses are applicable to the Remaining Phase 1 sites. Site-specific characteristics and impacts for each resource topic are provided in Chapter 7.

This EA/EIR also tiers from the "statutory considerations" discussed in Chapter 3. These discussions cover certain topics required under CEQA (see, for example, CEQA Guidelines at Section 15126), such as cumulative impacts, the significant environmental effects of the Proposed Project, the significant effects that cannot be avoided if the Proposed Project is implemented, and growth-inducing effects of the project. Because certain other discussions are also required under NEPA, Part 2 also includes additional "statutory consideration" discussions in Chapter 8. These additional discussions address special summary topics under NEPA, such as the significant irreversible and irretrievable commitments of resources and the relationship between local short-term uses of the environment and the maintenance of long-term productivity.

### 6.1.3 NEPA and CEQA Briefly Compared

The National Environmental Policy Act (NEPA) of 1969 establishes national policy for the protection of the environment. The NEPA process, as implemented by federal regulations and agency-specific regulations and procedures, is intended to promote decisions that are based on an understanding of environmental consequences and to encourage decision makers to take actions that protect, restore, and enhance the environment. The California Environmental Quality Act (CEQA) of 1970 is broadly similar to NEPA, although there are notable differences. The purpose of CEQA is to inform state and local governmental decision makers and the public about potential significant environmental effects of proposed activities, to identify ways to avoid or reduce environmental impacts, and to disclose the reasons why a project may be approved if significant environmental impacts would result.

NEPA and CEQA share similar goals of identifying and disclosing to decision makers and the public the potential environmental effects of a proposed action (or proposed project) before taking that action. Both the federal (NEPA) and the state (CEQA) statutes establish policies and procedures that require agencies to ensure that environmental information is made available and considered early in the planning process. The two statutes, as implemented by their respective regulations and guidance, set forth what are generally parallel procedural and documentation requirements, although, again, there are differences (for example, the "statutory consideration" discussions, as discussed above in section 6.1.2). Both statutes and their implementing regulations contain provisions for integrating other environmental review requirements, including the combination of the state and federal requirements. Combining NEPA and CEQA environmental review requirements in joint documents is encouraged under both acts.

While the two statutes share common goals and general environmental review requirements, there are important differences that must be considered in joint documents. NEPA is sometimes viewed as a procedural law, requiring federal agencies to conduct environmental reviews that comply with the statute

and associated implementing regulations. CEQA, in contrast, is partly "substantive," in that it requires an agency to adopt "feasible" mitigation measures for any "significant effect on the environment."

NEPA often functions as an "umbrella" statute, under which other federal environmental review requirements are addressed, such as the Section 106 process under the National Historical Preservation Act, air conformity determinations under the federal Clean Air Act, and various Executive Orders, including those pertaining to floodplains, wetlands, migratory birds, environmental justice, Indian sacred sites, and other topics at the federal level.

One important difference between NEPA and CEQA is the way significance is determined and addressed in environmental documents. Under NEPA, significance is used to determine whether an Environmental Impact Statement (EIS) will be required. NEPA requires that an EIS be prepared when the proposed federal action as a whole has the potential to "significantly affect the quality of the human environment." This determination of significance is based on "context" and "intensity." NEPA does not require that a determination of significant impacts be stated in the environmental documents.

CEQA requires that the lead agency identify each "significant effect on the environment" resulting from the project and ways to mitigate each significant effect. A significant effect on any environmental resource triggers the preparation of an EIR. Every significant effect on the environment must be disclosed in the EIR and mitigated, if feasible. CEQA requires that this document propose mitigation measures for each significant impact of the Proposed Project subject to the approval of an agency governed by California law, even when the mitigation measure cannot be adopted by the CEQA "lead agency" (in this case, the Regional Water Board), but can only be imposed by another responsible agency.

In addition, the CEQA Guidelines list a number of mandatory findings of significance, which also require the preparation of an EIR. There are no types of actions under NEPA that parallel the findings of mandatory significance in CEQA.

Because NEPA is concerned with the significance of the project as a whole, it is quite often the case that a "lower level" document is prepared for NEPA. The threshold for preparing an EIR under CEQA is lower than the threshold for preparing an EIS under NEPA. It is therefore not uncommon to have a joint NEPA/CEQA document that is not an EIS/EIR but rather an EA/EIR. Under NEPA, the general rule is that all alternatives must be analyzed and discussed to the same level of detail; CEQA requires only enough information about the alternatives to allow for meaningful comparison.

Because of the obligation under CEQA to mitigate "significant effects on the environment" when feasible, the characterization of impacts as being either "significant" or "less than significant" is very important under CEQA. For this reason, this integrated NEPA/CEQA document has been written in a manner that identifies, for CEQA purposes, "significance thresholds" for anticipated impacts. Some of these thresholds even have the force of law under CEQA. For example, CEQA Guidelines Section 15065 requires a "mandatory finding of significance" when a project "has the potential to substantially reduce the number or restrict the range of an endangered, rare or threatened species" listed under either the federal Endangered Species Act (ESA) (16 USC Section 1531 et seq.) or the California Endangered

Species Act (CESA) (California Fish and Game Code, Section 2050 et seq.). No such obligation exists under NEPA. CEQA thresholds of significance for other issue areas and resources were developed using applicable regulations when they exist, or best professional judgment.

### 6.1.4 Areas of Potential Controversy

To varying degrees, the issues listed below are anticipated to be controversial, primarily as they relate to discrete activities at specific sites. The potential for controversy focuses on the balance between existing resource uses and the potential for long-term restoration at various sites. The following issues are addressed in subsequent chapters of this document:

- impacts to special-status species, including anadromous salmonids;
- type, extent, and location of in-channel rehabilitation activities;
- the opportunity to use on-site sources of coarse sediment for long-term gravel enhancement program;
- impacts to public and private water supplies;
- impacts to existing recreational facilities;
- potential trespassing on private lands;
- potential spread of non-native invasive vegetation and techniques for non-native vegetation control;
- long-term ability of project sites to be maintained by flows;
- temporary access during construction;
- short-term construction impacts; and
- potential effects to Wild and Scenic River outstandingly remarkable values (ORVs).

### 6.1.5 Integration of Related Environmental Review Requirements

As mentioned above, and as discussed in Chapter 3, Regulatory Framework, the environmental processes under NEPA and CEQA facilitate the integration of other environmental review requirements. The NEPA process, particularly with respect to this document, is intended to be integrated with other environmental reviews, including but not limited to the Section 106 process under the NHPA and the Section 7 process under the federal ESA.

## 6.2 Purpose and Need

NEPA regulations require that an EA briefly specify the need that the agency is responding to in proposing the various alternatives, including the proposed action (40 CFR. Section 1508.9(a)). Similarly, CEQA requires that an EIR include a statement of the objectives to be achieved by a proposed project (CEQA Guidelines, Section 15124(b)). The objectives are discussed in Part 1, Chapter 2.1.

Overall, the purpose of the proposed action is to provide increases in habitat for all life stages of naturally produced anadromous fishes native to the Trinity River in the amounts necessary to reach

Congressionally mandated goals. The strategy is to initially create more habitat for native anadromous fish, and, over time, ensure that habitat complexity and abundance increase as the alluvial processes of the Trinity River are enhanced or restored in a manner that will perpetually maintain fish and wildlife resources (including threatened and endangered species) and the river ecosystem. The proposed action will continue to advance the implementation efforts of the TRRP and provides the opportunity to:

- increase the diversity and amount of habitat for salmonids, particularly habitat suitable for rearing;
- increase rearing habitat for juvenile salmonids, including coho and Chinook salmon and steelhead;
- ensure that the flows prescribed in the ROD will not increase the likelihood of flood-related impacts to public resources and private property within the project boundaries;
- increase the structural and biological complexity of habitat for various species of wildlife associated with riparian habitats;
- increase hydraulic and fluvial geomorphic diversity and complexity; and
- measure/demonstrate the ecological response to changes in flow regimes, morphological features, and aquatic, riparian, and upland habitats.

The underlying need for the Proposed Action (Proposed Project) is to restore fish populations to pre-dam levels and restore dependent fisheries, including those held in trust by the federal government for the Hoopa Valley and Yurok tribes. This need results from:

- requirements in the ROD (U.S. Department of Interior 2000) to restore the Trinity River fishery through a combination of higher releases from Lewiston Dam (up to 11,000 cfs), floodplain infrastructure improvements, channel rehabilitation projects, fine and coarse sediment management, watershed restoration, and an AEAM Program; and
- the expectation that the AEAM Program will continue to incorporate the experience provided through the planning, design, and implementation of the Proposed Action into future restoration and rehabilitation efforts proposed by the TRRP.

## 6.3 Proposed Project/Proposed Action

The Proposed Action addressed in this EA/EIR is the implementation of the mechanical channel rehabilitation and sediment management activities at the six Remaining Phase 1 sites, as described in detail in Part 1, Chapter 2. The following are the Remaining Phase 1 sites: Sawmill (SM), Upper Rush Creek (UR), Lowden Ranch (LR), Trinity House Gulch (THG), Steel Bridge Day Use (SB), and Reading Creek (RC).

This EA/EIR uses the term "proposed project," a CEQA term that is essentially synonymous with the NEPA term "proposed action." For the remainder of this document, "Proposed Project" is also used to refer to the NEPA Proposed Action with respect to the activities at the Remaining Phase 1 sites.

CHAPTER 7

# Environmental Setting and Environmental Impacts– Remaining Phase 1 Sites

SECTION 7.1

# Introduction to the Analysis

# Chapter 7

# Environmental Setting and Environmental Impacts– Remaining Phase 1 Sites

## 7.1 Introduction to the Analysis

This EA/EIR assesses the site-specific environmental consequences (or "impacts") associated with implementing the proposed rehabilitation activities at the Remaining Phase 1 sites. The regulatory framework, environmental setting, methodology, and significance criteria discussed in Part 1, Master EIR (Chapters 3 and 4) are generally applicable to the Remaining Phase 1 sites, and this information is not repeated in this chapter. Instead, the focus is on site-specific characteristics, impacts, and mitigation measures (as applicable) for each Remaining Phase 1 site.

As in Part 1, the environmental analyses in Part 2 are presented by environmental resource area. As described further below, the analysis for each resource area includes discussions of the affected environment (CEQA "existing conditions"), the potential environmental impacts (CEQA "environmental impacts"), methodology, significance criteria (if applicable), and mitigation measures. While many of the same resource areas are discussed under both CEQA and NEPA, two resource areas are addressed specifically to satisfy federal requirements under NEPA, even though they are not necessarily required to comply with CEQA. Accordingly, the resource areas addressed in this part are the same as in Part 1, with the addition of discussions of Tribal Trust (section 7.17), and Environmental Justice (section 7.18), which have their regulatory basis in federal mandates and are, therefore, addressed in this integrated part of the document as required under NEPA.

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/energy
- transportation/traffic circulation
- tribal trust
- environmental justice

Site-specific characteristics and impacts related to the Remaining Phase 1 sites are provided in the subsequent sections of this chapter. To simplify this chapter, information provided in Chapter 3 – Regulatory Framework is incorporated by reference into the following sections. Each resource area section is organized in the following manner.

### 7.1.1 Affected Environment/Environmental Setting

The Affected Environment (or CEQA "existing conditions") sections for each of the issues discussed supplements the information in the corresponding section of Chapter 4 as necessary to describe the existing regional and local conditions for the Remaining Phase 1 sites. The affected environment establishes the context for each section of this chapter pursuant to 40 CFR Section 1508.27 (a). 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 (See CEQA Guidelines, Section 15125, subd. (a)).

### 7.1.2 Environmental Consequences and Mitigation

As required by the CEQA Guidelines, the impacts of a proposed project (action) are defined as "a change in the existing physical conditions in the affected area as they exist at the time the notice of preparation is prepared" (Section 15126.2). For purposes of NEPA, the term "environmental consequences" is synonymous with the term "impacts." The environmental consequences discussion addresses the intensity of the project as required by 40 CFR Section 1508.27 (b). 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 following subsections for each resource area are incorporated by reference from Part 1 of this document:

- *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 this document (PRC Section 21100 and CEQA Guidelines Section 15128).

The following subsections are also presented in the Environmental Consequences section for each issue area:

- *Summary of Impacts Table.* At the beginning of the Impacts and Mitigation Measures subsection is a table that identifies all the impacts evaluated for that particular environmental issue area (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-Action Alternative. To enhance readability, the tables provide additional columns that describe 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 for each alternative that is fully evaluated in the EA/DEIR. In instances where the effects of one alternative are similar to another alternative, redundant impact analysis is not presented; rather a simple statement to the effect that the impacts of the two alternatives are similar is provided. An example of the impact analysis structure is provided below.

**Table 7.2-2. Summary of Potential Land Use 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 7.2-1. Implementation of the project could disrupt existing land uses adjacent to the project site. | | | | |
| No Impact | Less than significant | Less than significant | Not applicable[1] | Not applicable[1] |

**Impact 7.2-1: Implementation of the project could disrupt existing land uses adjacent to the project 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…

### *Proposed Project*

Construction and maintenance of the Proposed Project…

### *Alternative 1*

Land use impacts associated with Alternative 1 are similar to those of the Proposed Project…

## Mitigation

Potentially feasible mitigation measures that would reduce significant impacts associated with each of the alternatives to less-than-significant levels are provided after each impact discussion. Consistent with Reclamation's NEPA requirements, mitigation measures can also be viewed as environmental commitments. If any instances arise where no feasible mitigation can be identified, such impacts are identified as significant and unavoidable. Similar to the organization presented in Chapter 4, an alphanumeric coding system is used to present each mitigation measure. For example, Mitigation Measure 1 would correspond to the first impact statement listed in the impact discussion. 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 were 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*

**7.2-1a** Reclamation shall clearly identify all ...

#### *Alternative 1*

**7.2-1a** Reclamation shall clearly identify all ...

### Significance after Mitigation

Less than significant

SECTION 7.2

# Land Use

# 7.2 Land Use

This section describes existing and planned land uses in the vicinity of the Remaining Phase 1 sites and evaluates the potential impacts to land uses from implementation of the Proposed Project and its alternatives at the Remaining Phase 1 sites.

## 7.2.1 Affected Environment/Environmental Setting

### Existing Land Uses

As discussed in section 4.2, existing land uses typical of the Remaining Phase 1 sites are primarily residential, resource, recreation, and open space. Both private and public land ownership occurs in the Remaining Phase 1 project area. Public land in and adjacent to the Remaining Phase 1 sites is primarily used for resource management and recreation. Remaining Phase 1 sites in the Lewiston Community Plan area are located north of SR 299 and adjacent to local roads. Remaining Phase 1 sites in the Douglas City Community Plan area are located in close proximity to SR 299 and SR 3, and are adjacent to local roads (Figure 1-2).

As noted in section 4.2, the reaches of the Trinity River located within the Remaining Phase 1 sites are used by anglers, rafters, wildlife watchers, and tourists. The river is accessible at several public and private locations throughout the Remaining Phase 1 sites, notably at the Rush Creek River Access, the Steel Bridge Day Use Area, and the Douglas City Campground.

Table 7.2-1 characterizes the land ownership and land use zoning districts that apply to each of the Remaining Phase 1 sites.

**Table 7.2-1. Land Ownership and Use in the Remaining Phase 1 Project Boundaries**

| Site | Area of Site (Acres) | Public Ownership (Acres) | Private Ownership (Acres) | Land Use Zoning Districts |
|---|---|---|---|---|
| Sawmill (SM) | 103.4 | 89.6 | 13.8 | Resource<br>Rural Residential<br>Open Space |
| Upper Rush Creek (UR) | 92.3 | 5.8 | 85.7 | Resource<br>Rural Residential<br>Open Space<br>Commercial |
| Lowden Ranch (LR) | 186.4 | 182.6 | 3.8 | Resource<br>Rural Residential<br>Open Space |
| Trinity House Gulch (THG) | 43.7 | 29.0 | 14.7 | Rural Residential<br>Resource<br>Open Space |

**Table 7.2-1. Land Ownership and Use in the Remaining Phase 1 Project Boundaries**

| Site | Area of Site (Acres) | Public Ownership (Acres) | Private Ownership (Acres) | Land Use Zoning Districts |
|---|---|---|---|---|
| Steel Bridge Day Use (SB) | 22.4 | 22.2 | 0.2 | Rural Residential<br>Resource |
| Reading Creek (RC) | 135.8 | 67.3 | 68.5 | Community Development<br>Rural Residential<br>Open Space |

## Local Planning

### *Trinity County General Plan Land Use Designations*

The Trinity County General Plan (Trinity County 2003) is discussed in Chapter 4.2. Under this plan, lands within the Remaining Phase 1 site boundaries fall within the following five land use categories: Community Development, Resource, Rural Residential, Open Space, and Commercial. The County has established zoning districts that provide an additional level of specificity for planning purposes. For a detailed discussion of Trinity County General Plan land uses and definitions, refer to the Master EIR (section 4.2, Table 4.2-1).

### *Community Plans*

The Remaining Phase 1 sites are located within the Lewiston Community Plan and Douglas City Community Plan planning areas. These community plans are discussed in the Master EIR (section 4.2).

## Land Uses Associated with the Remaining Phase 1 Rehabilitation Sites

### *Rehabilitation Sites in Lewiston*

Four of the Remaining Phase 1 sites (SM, UR, LR, and THG) are encompassed by the Lewiston Community Plan area. The SM and UR sites are in the Rush Creek Road and Goose Ranch Road neighborhoods. The Rush Creek Road neighborhood parallels the river to the north (right side of the river). The Rush Creek Road area located in and adjacent to the SM and UR sites is primarily Rural Residential with minimal parcel sizes ranging from 1–5 acres. The Goose Ranch Road neighborhood parallels the river to the south (left side of the river). Most of the parcels in this neighborhood that are adjacent to the SM and UR sites have direct river access and are zoned Rural Residential, with 2.5- to 5-acre minimum parcel sizes. The LR and THG sites are located in the Old Lewiston Road neighborhood. This area generally consists of agriculture, resource, and residential land uses, with parcel sizes varying from 5–40 acres.

### Sawmill

The SM site is primarily comprised of publicly owned land managed for resource uses and recreation by Reclamation and CDFG. A few private parcels are used for residences at the downstream end of the site

on both the left and right sides of the river. No structures or buildings are present within this project site boundary.

Land use zoning districts at this site include Rural Residential and Open Space. Portions of the site in the 100-year floodplain have been designated as "Zone AE" and "Zone X" Flood Hazard Area by FEMA. The areas in the 100-year floodplain of the Trinity River have been designated by Trinity County as Scenic Conservation Zones, thereby restricting development.

## Upper Rush Creek

The UR site is primarily comprised of private land used for residential purposes, but has one commercial user (the Trinity River Lodge). Riparian vegetation has been removed in much of this area and has been replaced with lawns and gardens associated with residential use. Some structures are present at this site. BLM manages the portion of this site where the Rush Creek River Access is located (the right side of the river adjacent to Rush Creek Road).

Land use zoning districts at this site include Rural Residential, Commercial, Flood Hazard, Scenic Conservation, and Open Space. Portions of the site in the 100-year floodplain have been designated as "Zone AE" and "Zone X" Flood Hazard Area by the FEMA. The areas in the 100-year floodplain of the Trinity River have been designated by Trinity County as Scenic Conservation Zones.

## Lowden Ranch

The LR site is primarily comprised of public lands managed by BLM and DWR. Land managed by BLM covers a large portion of the site, stretching from Lewiston Road (south) across the river to an area above Browns Mountain Road (north). The DWR manages 90 acres of land abutting Grass Valley Creek and the Trinity River. Private land is located at the upstream and downstream ends of the site. Private land at the upstream end of the site includes Bucktail Subdivision (right side of the river), which consists of residential parcels of 1 acre or larger, and residential parcels on the left side of the river that are 5 acres or larger. A few large residential and agricultural parcels are located at the downstream end of the site. No structures are located at the site.

Land use zoning districts at the LR site include Rural Residential, Agriculture, Scenic Conservation, Open Space, and Flood Hazard. Portions of the site in the 100-year floodplain have been designated as "Zone AE" and "Zone X" Flood Hazard Area by FEMA. The areas in the 100-year floodplain of the Trinity River have been designated by Trinity County as Scenic Conservation Zones.

## Trinity House Gulch

The THG site is primarily comprised of public land managed by BLM. Private lands are located at the upstream portion of the site on both sides of the river. Private land uses in and adjacent to this site consist of residential and agricultural land uses. No structures are present at this site.

Land use zoning districts at this site include Agriculture, Rural Residential, Scenic Conservation, Open Space, and Flood Hazard. Portions of the site in the 100-year floodplain have been designated as "Zone

AE" and "Zone X" Flood Hazard Area by FEMA. The areas in the 100-year floodplain of the Trinity River have been designated by Trinity County as Scenic Conservation Zones.

### *Rehabilitation Sites in Douglas City*

Two Remaining Phase 1 sites (SB and RC) are encompassed by the Douglas City Community Plan area. The SB site is located adjacent to the Steel Bridge Road neighborhood, which is characterized as a riverbank community with residential and resource land uses. Parcel sizes in this neighborhood vary from 3–20 acres. The RC site is located adjacent to the Community Core neighborhood, which consists of a variety of land uses including public services, commercial, mobile home parks, and single family residential.

## Steel Bridge Day Use

The SB site is primarily comprised of public land managed by BLM, and coincides with the recreational development known as the Steel Bridge Day Use Area. This site is not included within a discrete zoning district. BLM's recreational area extends upstream beyond the site boundary. Private land is located within the center of the site, and is adjacent to Steelbridge Road. There are no residences located within the site; however, there are several residences immediately downstream of the site. Several structures associated with recreation uses exist at the SB site.

## Reading Creek

Public lands within the RC site are managed by BLM for recreation, as are some areas of private land in the upstream portion of the site. BLM manages the Douglas City Campground along the right side of the river. Private land uses in and adjacent to the site include single-family residences and a mobile home park located at the upstream portion of the site on both sides of the river. Dredge tailings and berms are present at this site, along with some ponds in previously excavated areas. Several structures exist at this site.

Land use zoning districts at the RC site include Rural Residential, Commercial, Mobile Home Park, Scenic Conservation, Open Space, and Flood Hazard. Portions of the site in the 100-year floodplain have been designated as "Zone AE" and "Zone X" Flood Hazard Area by the FEMA.

### *Trinity County Zoning*

The Trinity County Zoning Ordinance is discussed in section 4.2, Land Use and Trinity County zoning districts that apply to lands within the site boundaries are identified in Table 4.2-2. As discussed in section 4.2, all areas in the 100-year floodplain of the Trinity River have been designated by Trinity County as Scenic Conservation Zones. Land zoned as Timber Harvest, Ag Forest, and Agriculture exists adjacent to these sites; however, no timber production or agricultural activities extend into the sites, nor do these sites contain any lands designated as Prime Farmland, Unique Farmland, or Farmlands of Statewide Importance.

Detailed descriptions of Trinity County zoning districts can be found in section 4.2, Table 4.2-3.

### *Proposed Land Uses*

Public lands within and adjacent to the Remaining Phase 1 sites are managed by federal, state, or local agencies according to resource and recreation goals and policies. In general, privately owned parcels within and adjacent to these sites have been subdivided to the fullest extent possible under existing zoning designations. Figures 7.2-1a-f illustrate the land ownership pattern for each site. Therefore, future rural residential development on the uplands, above the river's floodplain, would be minimal. Future development is further restricted by the proximity of parcels to the Trinity River; many of these parcels are zoned Flood Hazard and Open Space. Proposed project activities would not result in any changes that would conflict with future proposed land uses.

## 7.2.2 Environmental Consequences/Impacts and Mitigation Measures

Table 7.2-2 summarizes land use impacts that could result from implementation of the No-Project Alternative, the Proposed Project, and Alternative 1.

**Table 7.2-2. Summary of Potential Land Use 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 7.2-1. 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] |
| Impact 7.2-2. 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 7.2-3. Implementation of the project may affect the availability of a locally important mineral resource recovery site. | | | | |
| 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 7.2-1: 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 restoration activities would occur at any of the Remaining Phase 1 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 sites, nor would it obstruct the water conveyance functions of the 100-year floodplain. Project activities that aim to restore floodplain functions 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 the communities of Lewiston and Douglas City that could occur because of rehabilitation activities at the Remaining Phase 1 sites. 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. Much of the construction and most staging areas would be located on state or federal lands within these sites. Rehabilitation activities and river access would also occur on private lands within and adjacent to these sites. Staging, construction, and access on private lands in and adjacent to the site boundaries would require landowner approval. Residential and commercial development located within or near these 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.

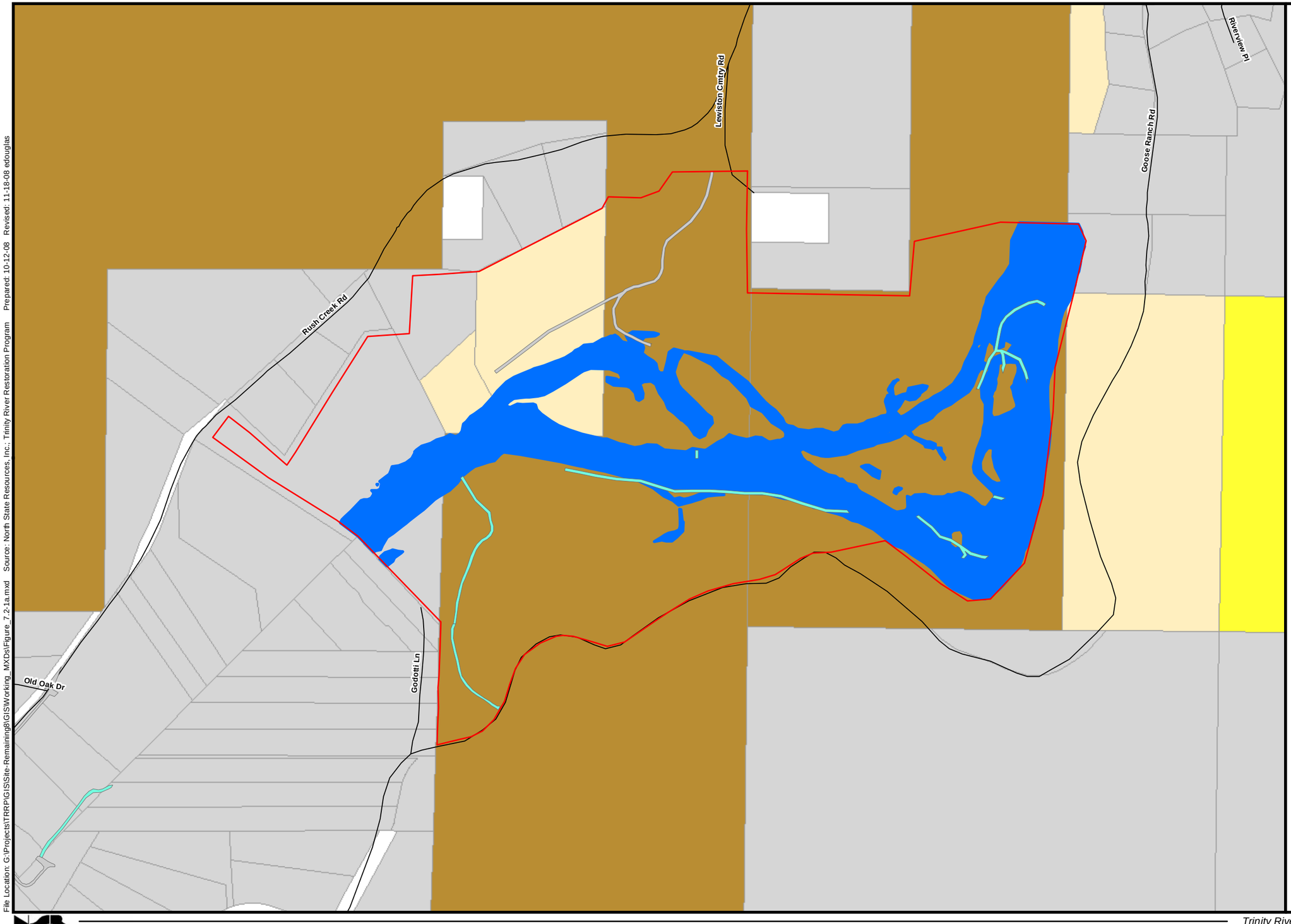
The following paragraphs discuss each of the Remaining Phase 1 sites and the adjacent land uses.

#### Sawmill

Project staging and construction activities at the SM site would occur in close proximity to several residences; however, project activities would not interfere with, preclude, or conflict with adjacent land uses. Staging areas for this site would be located primarily on Reclamation and CDFG lands on the right side of the river and adjacent to Lewiston Cemetery Road. One staging area would be located on private land in the 100-year floodplain that is designated as Open Space. The majority of upland restoration would occur on state and federal lands. A small portion of upland restoration would occur on private land in the 100-year floodplain. The upland activity areas identified as U-1 SM and U-2 SM would be located near several residences that are situated between Rush Creek Road and Lewiston Cemetery Road.

#### Upper Rush Creek

Project staging and construction activities at the UR site would occur in close proximity to several residences and a resort; however, project activities would not interfere with, preclude, or conflict with adjacent land uses. This site includes the highest proportion of private land of all the Remaining Phase 1 sites, as well as several parcels managed by BLM. Staging areas would be located on the right side of the river on BLM parcels (e.g., parking area) and on vacant private land in the 100-year floodplain. The staging areas on private land would be partially screened from nearby residences by vegetation. Upland restoration proposed for this site would be located near residences. The activity area identified as U-1 UR would be located between BLM's parking area and the adjacent residence. This residence is partially

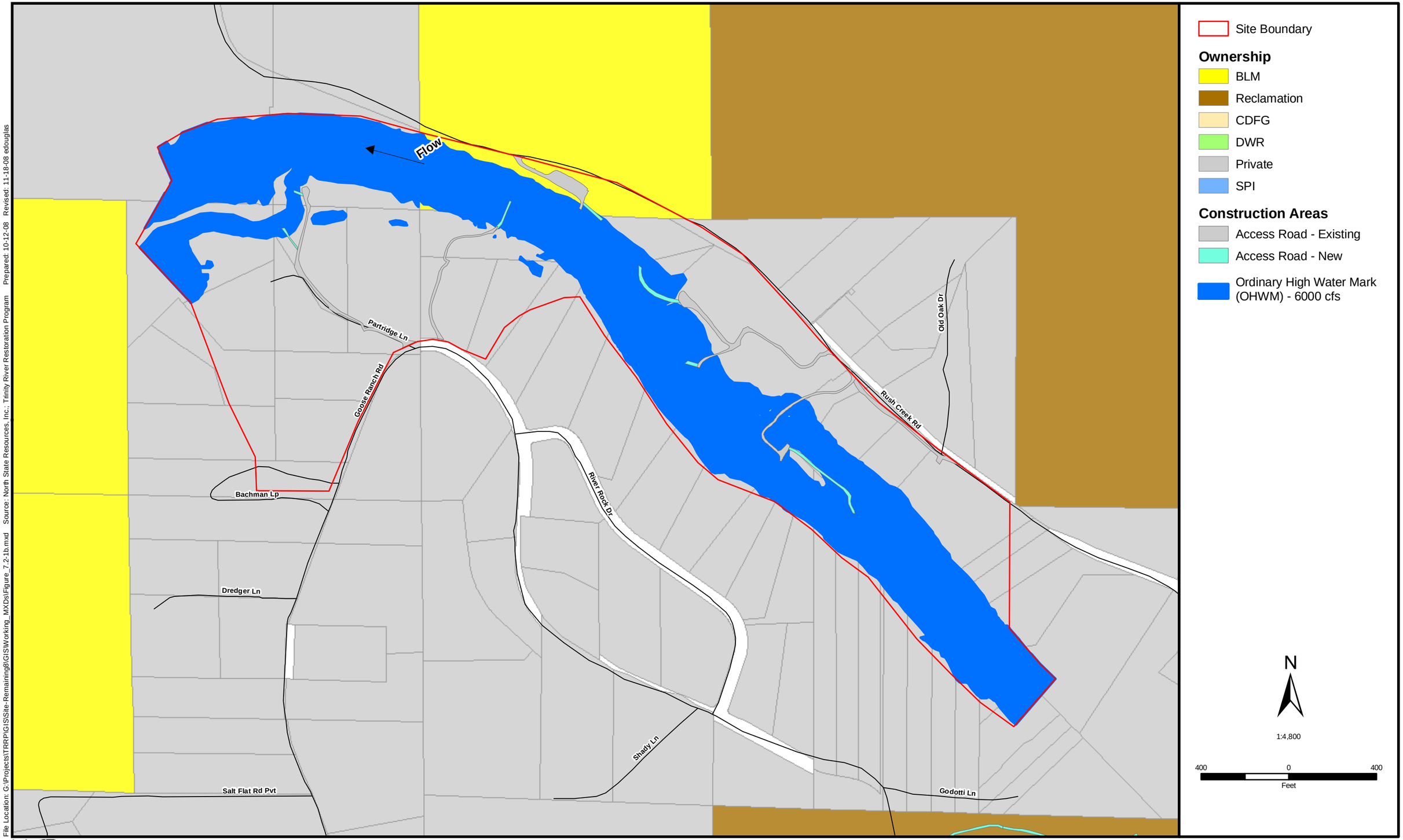



File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7.2-1a.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-12-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.2-1a**
**Sawmill - Land Ownership**

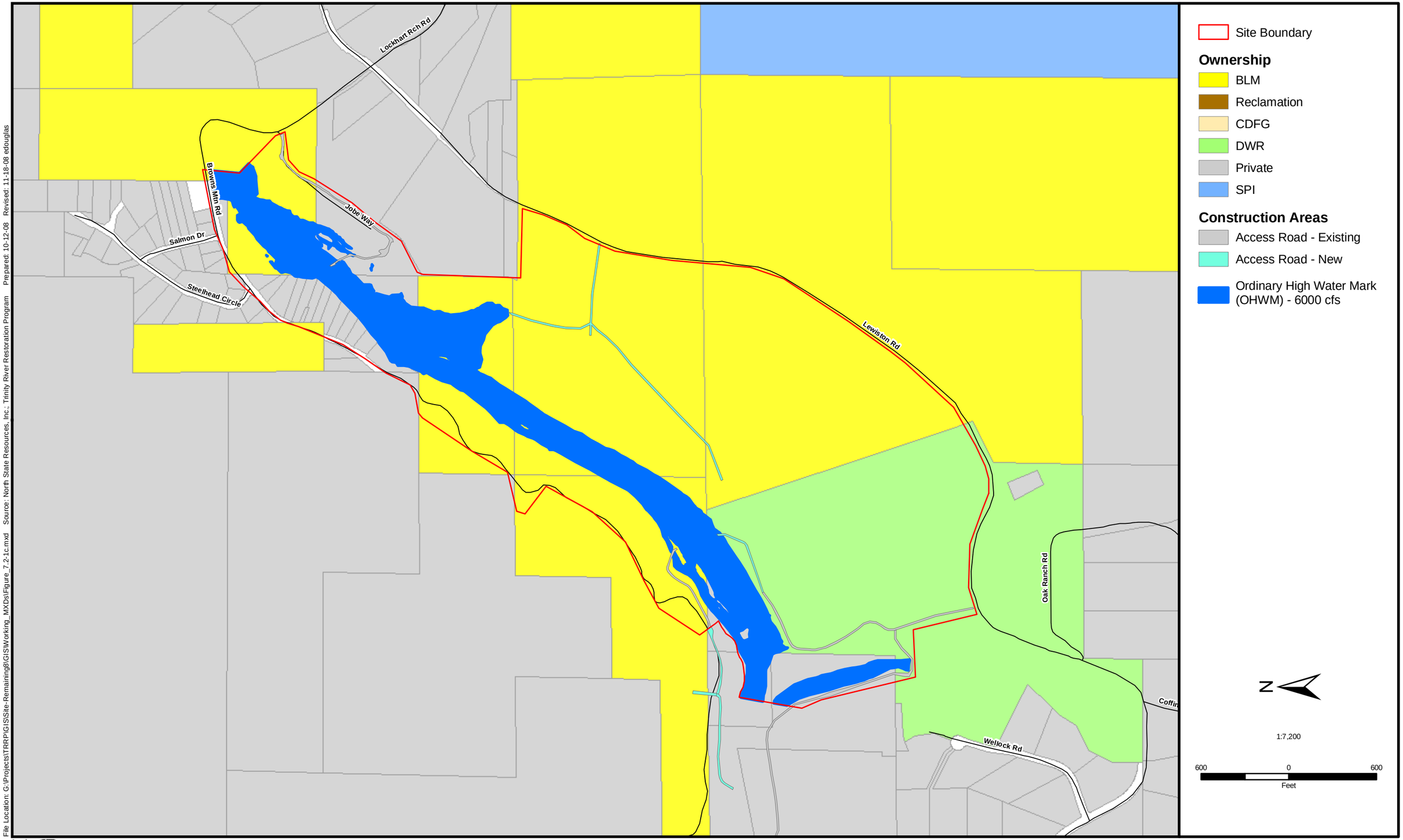



File Location: G:\Projects\TRRP\GIS\Site-Remaining\GIS\Working_MXDs\Figure_7.2-1b.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-12-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.2-1b**
**Upper Rush Creek - Land Ownership**

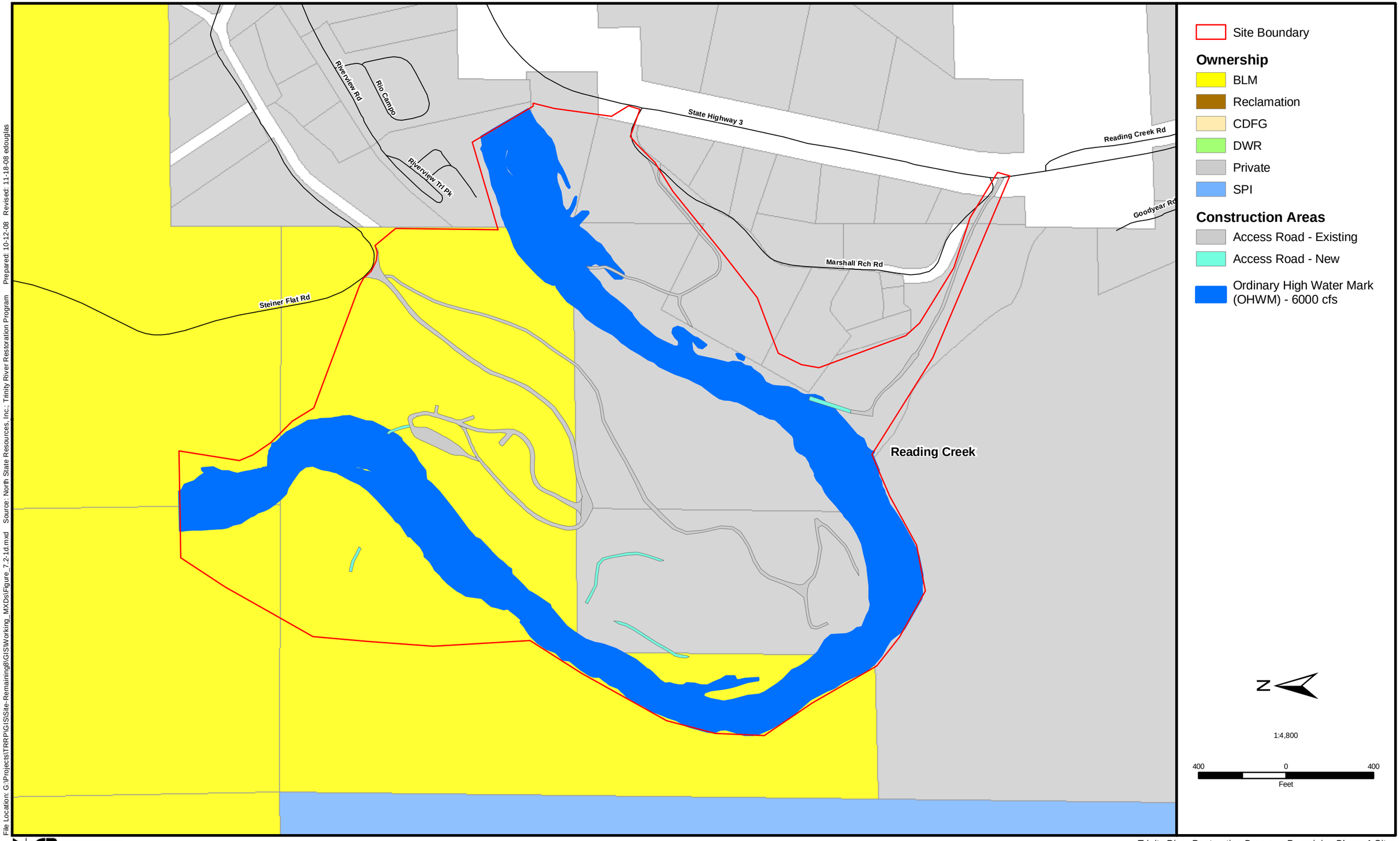



File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7.2-1c.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-12-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.2-1c**
**Lowden Ranch - Land Ownership**

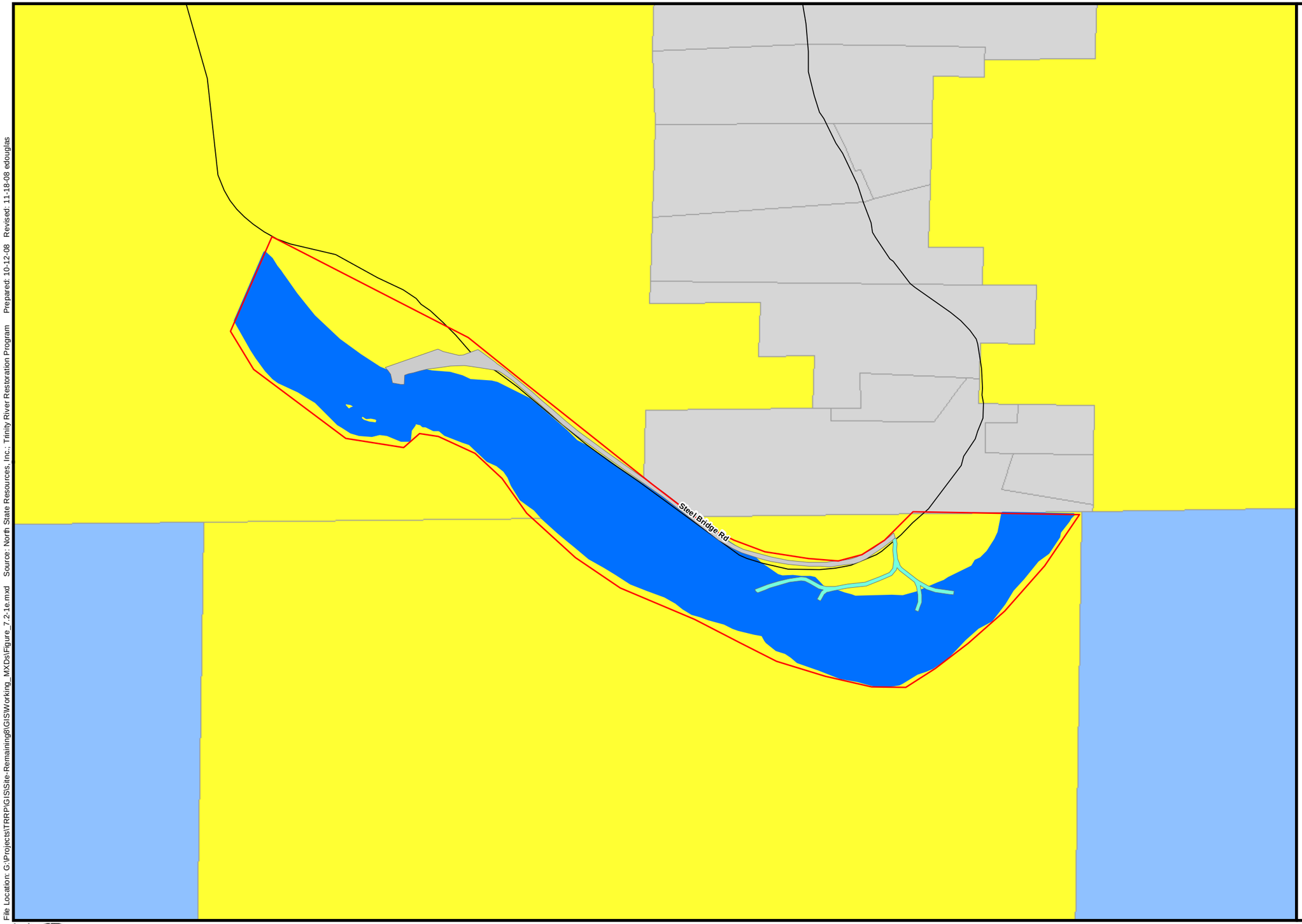



File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7.2-1d.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-12-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.2-1d**
**Trinity House Gulch - Land Ownership**




Site Boundary

**Ownership**

- BLM
- Reclamation
- CDFG
- DWR
- Private
- SPI

**Construction Areas**

- Access Road - Existing
- Access Road - New
- Ordinary High Water Mark (OHWM) - 6000 cfs

N

1:3,600

300 0 300

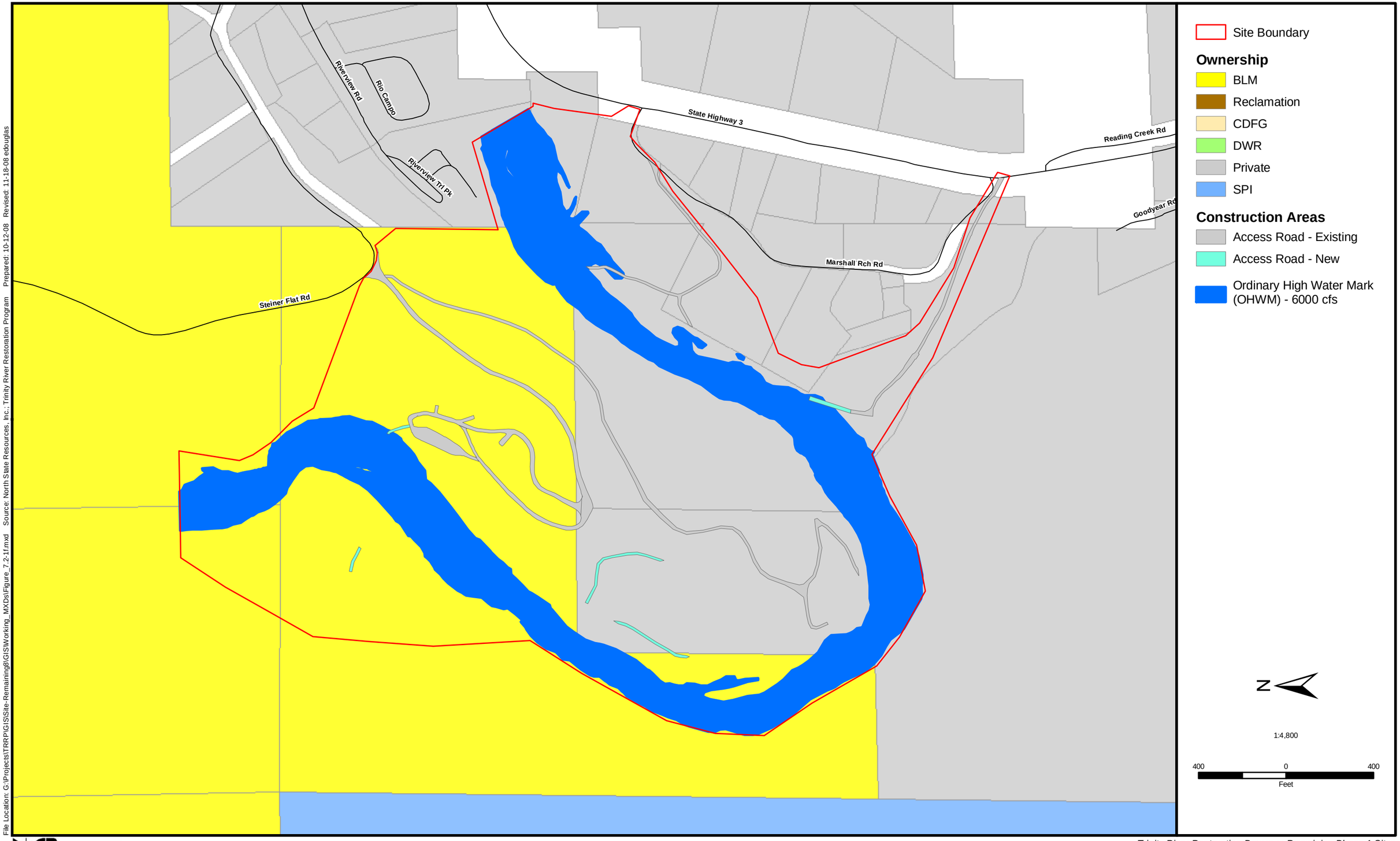
Feet

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7.2-1e.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-12-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.2-1e**
**Steel Bridge Day Use - Land Ownership**




File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7.2-1f.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-12-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.2-1f**
**Reading Creek - Land Ownership**

buffered by vegetation. Activity area U-2 UR would be located on vacant land adjacent to Rush Creek Road. The nearest residence, located to the southeast, would be buffered by vegetation and the next nearest residence to the southwest would be partially buffered by vegetation.

## Lowden Ranch and Trinity House Gulch

Project staging and construction activities at the LR and THG sites would occur in close proximity to several residences and near agricultural lands; however, project activities would not interfere with, preclude, or conflict with adjacent land uses. Staging areas for these sites would be located on BLM parcels to avoid impacts to residential and commercial land uses. Some upland activity would occur near a residence at activity areas U-1 LR and U-2 LR. Upland activities would occur in an open field; however, the nearby residence is buffered by vegetation. Instream channel activities would occur adjacent to the Bucktail Subdivision. Riparian vegetation provides a buffer for the majority of the in-channel activity areas located adjacent to the residences in the Bucktail Subdivision. These activity areas include IC 1LR, IC-2 LR, IC-3LR, and a portion of R-1 LR. In-channel activities proposed for the THG site would be located approximately 500 feet from the nearest residences. A large sloping field and vegetation separates these areas from nearby residences located on the left side of the river.

## Steel Bridge Day Use

Project staging and construction activities at the SB site would occur in a recreation area and in close proximity to a few residences; however, project activities would not interfere with, preclude, or conflict with recreation activities upstream of the site or adjacent residential land uses. Staging areas would be located on BLM parcels near the upstream boundary of the site. One of the staging areas would be relatively close to the adjacent residence (approximately 150 feet) due to topographical constraints of this site. Additionally, the staging areas were placed within the boundary of activity area R-1 SB to reduce the direct impacts to the land and biological communities and to reduce the impacts on non-renewable resources such as fuel. The staging area adjacent to the private parcel would be buffered from the residence by vegetation. Construction activities involving the south portion of BLM's day use area would temporarily preclude some recreation activities; however, the north portion of BLM's day use area would be open for recreation use while construction activities occur. Impacts associated with recreation are discussed in sections 4.8 and 7.8, Recreation.

## Reading Creek

Project staging and construction activities at the RC site would occur in close proximity to several residences, a mobile home park, and BLM's Douglas City Campground; however, project activities would not interfere with, preclude, or conflict with adjacent land uses and would only have a temporary affect on recreational facilities located within the site. Staging areas would be located primarily on BLM parcels associated with the campground. One staging area would be located on private land on the left side of the river in a vacant field near SR 3 and Marshall Road.

Based on the analysis above, potential conflicts with or disruptions to adjacent land uses resulting from activities associated with Proposed Project at the Remaining Phase 1 sites would be temporary and less than significant.

As discussed in sections 4.16 and 7.16, Transportation and Traffic, no road closures would result from implementation of the Proposed Project at these sites. As described in Chapter 2, access to adjacent residences would be maintained during project construction and post-construction monitoring activities. However, access to adjacent residences could be temporarily disrupted (minor delays or detours) during deployment of heavy equipment to and from the rehabilitation sites.

Temporary disruption of public access to the river could occur at a number of Remaining Phase 1 sites (e.g., Rush Creek River Access, Steel Bridge Day Use Area, and Douglas City Campground), but the duration would be limited. Activities proposed at the Remaining Phase 1 sites would be implemented over the course of 3– 5 years and would not preclude access from nearby access points, located several miles upstream and downstream of these sites. For example, while Remaining Phase 1 activities may be implemented at the UR site, river access would still be available at the Old Lewiston Bridge and Bucktail river access points. Therefore, the impact would be less than significant.

Construction activities in the river channel could interrupt adjacent land uses for short periods; but they would not preclude the use of businesses or residences. Construction and transportation associated with the Proposed Project could produce minor nuisance effects (i.e., noise, air quality, and aesthetics) 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 noise, air quality, and aesthetics are discussed in sections 4.16 and 7.16, sections 4.11 and 7.11, and sections 4.14 and 7.14, respectively.

### *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 smaller areas of disturbance and smaller project areas at five of the Remaining Phase 1 sites. There is no distinction between the Proposed Project and Alternative 1 at the SM site.

## 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 7.2-2: Implementation of the project may be inconsistent with the goals, policies, and objectives of the STNF LRMP, BLM's RMP, and the Trinity County General Plan, as well as 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 Remaining Phase 1 rehabilitation activities would not occur. Therefore, there would be no impact.

### *Proposed Project and Alternative 1*

Implementation of activities proposed under the Proposed Project and Alternative 1 at the Remaining Phase 1 sites would not introduce land uses that are incompatible with existing or proposed land uses, nor would rehabilitation activities conflict with any land use plan, policy, or ordinance. This impact would be the same as Impact 4.2-2 discussed in section 4.2.2. Therefore, the impacts would be less than significant.

Appendix A documents the determination that the activities proposed at the Remaining Phase 1 sites would be consistent with the ACS. The discussion provided for Impact 4.2-2 in section 4.2.2, Land Use summarizes the project's consistency with federal, state, and local plans, policies, and ordinances.

## 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 7.2-3: Implementation of the project may affect the availability of a locally important mineral resource recovery site.** ***No impact for the No-Project Alternative, less than significant 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.

### *Proposed Project and Alternative 1*

There are no locally important mineral recovery sites located within or adjacent to the Remaining Phase 1 sites, or within 10 river miles of the project boundaries. Although there are properties that may have some ongoing mineral recovery efforts, the TRRP has worked closely with the mining community to locate site boundaries in a manner that minimizes any mineral recovery efforts. Therefore, both the Proposed Project and Alternative 1 would have 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

SECTION 7.3

# Geology, Fluvial Geomorphology, Minerals, and Soils

# 7.3 Geology, Fluvial Geomorphology, Minerals, and Soils

This section describes geologic, fluvial geomorphic, and soils resources in the vicinity of the Remaining Phase 1 rehabilitation sites and evaluates the potential impacts to these resources from implementation of the Proposed Project or its alternatives at the Remaining Phase 1 sites.

## 7.3.1 Affected Environment/Environmental Setting

### Geology of the Remaining Phase 1 Sites

#### *Sawmill*

The Copley Greenstone is exposed along both sides of the channel in the SM site and presumably underlies the entire site. Granitic rocks are exposed south of the site boundary; however, the extent of this exposure is obscured by the terrace deposits that extend over most of the site on both sides of the river. The Copley Greenstone is considered stable and erosion-resistant, and the granitic rocks are considered highly-erodible. Typically soil disturbance on granitic terrain will likely have higher rates of subsequent erosion than disturbance activities on metamorphic terrain (e.g., Copley Greenstone).

#### *Upper Rush Creek*

At least three geologic units occur within the boundaries of the UR site. The aerial extent of each unit within this site is unknown because they are covered by modern alluvial deposits on both sides of the river. The underlying geology appears to have a complex spatial relationship, and it is likely that the boundaries between these units are highly variable. Granitic rocks are located near the western project boundary. The metasediment and sedimentary rocks of the Bragdon Formation and the metamorphosed pyroclastic rocks of the Copley Greenstone have mixed exposure along the north and south banks of the Trinity River. The Copley Greenstone is the most erosion-resistant, followed by the Bragdon Formation, and granitic rocks, respectively. Therefore, rehabilitation activities in granitic terrain will likely have higher rates of subsequent surface erosion than rehabilitation activities in the Copley Greenstone or Bragdon Formation.

#### *Lowden Ranch*

Several geologic units occur within the boundaries of the LR site. Broad, flat terrace deposits covered with modern alluvial deposits extend over a majority of the area. The modern alluvial deposits along the south bank of the river are likely underlain by the thinly-bedded shale of the Bragdon Formation on the western portion of the site. Granitic rocks are evident along the eastern portion of the site, and the Copley Greenstone is exposed along the right bank of the Trinity River. Because a majority of the rehabilitation activities could occur on the left bank of the river, the landforms influenced by these geologic units may inhibit access to some uplands activities such as staging. Of the three geologic units that occur, the Copley Greenstone is considered the most resistant to erosion, followed by the Bragdon Formation, and granitic rocks.

### *Trinity House Gulch*

Even though the THG site is immediately downstream and adjacent to the LR site, the bedrock geology of the two sites varies. The THG site is underlain by Abrams Mica Schist along the right bank of the Trinity River and by the sedimentary deposits of the Weaverville Formation along the left bank. A small intrusion of ultrabasic intrusive rock is exposed along the left bank of the river, serving as a grade control in this reach. A broad floodplain covered with modern alluvial and remnant glacial deposits covers a majority of the project site and obscures the aerial extent of these geologic units. Since a majority of the rehabilitation activities would occur in association with the modern alluvial deposits, the presence, exposure, and extent of the underlying geologic units should not be limiting factor, other than activities related to road and staging areas. Of the three geologic units, the Abrams Mica Schist is considered the most resistant to erosion, followed by the Weaverville Formation and the ultrabasic deposits, respectively.

### *Steel Bridge Day Use*

The entire SB site is underlain by the moderately-erodible rocks of Abrams Mica Schist. The Abrams Mica Schist is considered moderately erodible, but layers of less competent rock may exist within the unit.

### *Reading Creek*

The entire RC site is likely underlain by Abrams Mica Schist. However, this cannot be verified because exposure within the site boundary is obscured by the presence of modern alluvial deposit, including extensive dredge tailing along the river. The Abrams Mica Schist is considered moderately erodible, but layers of less competent rock may exist within the unit.

## Regional/Local Fluvial Geomorphology

A discussion of the regional and local fluvial geomorphology is discussed in the Master EIR (section 4.3).

## Fluvial Geomorphology – Remaining Phase 1 Sites

The geomorphic environment of the Remaining Phase 1 sites is directly affected by the hydrology, channel bed composition, sediment regimes, and riparian vegetation at these six sites. Each site contains a number of distinct morphological features that depend on a variety of physical processes to maintain their fundamental structure. Modification of the channel and floodplain configurations within these sites has altered and simplified the natural diversity of geomorphic processes and products; hence, limiting the variety of channel forms, habitats, and vegetation structures.

Extensive modification of historic and modern alluvial landforms within these sites is evident by the aerial extent of channel modifications resultant from historic mining and, more recently, impacts related to the TRD. A comprehensive discussion of these modifications is provided in section 7.10, Cultural Resources. Geomorphic features that were modified directly or indirectly by human intervention account for approximately 56 percent of the total area within the site boundaries, primarily modified terrace deposits. Table 7.3-1 provides a summary of the geomorphic features for each site. Based on the area of

human disturbance, it is apparent that human intervention has altered the morphology, to varying degrees at each of the sites.

**Table 7.3-1. Area of Remaining Phase 1 Sites Occupied by Selected Geomorphic Features**

| Geomorphic Feature | Sawmill (acres) | Upper Rush Creek (acres) | Lowden Ranch (acres) | Trinity House Gulch (acres) | Steel Bridge Day Use (acres) | Reading Creek (acres) | Total (acres) |
|---|---|---|---|---|---|---|---|
| Vegetated Riparian Berm* | 1.58 | 0.21 | 0.21 | 0.83 | 0.78 | 3.81 | 7.42 |
| Delta | 0.00 | 0.20 | 0.20 | 0.43 | 0.00 | 0.19 | 1.02 |
| Floodplain | 1.26 | 9.02 | 19.92 | 2.87 | 3.73 | 7.57 | 44.37 |
| Levee* | 0.00 | 0.00 | 1.54 | 0.45 | 0.00 | 0.00 | 1.99 |
| Modified Floodplain* | 8.98 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.98 |
| Modified Terrace* | 52.26 | 48.59 | 157.09 | 14.90 | 3.24 | 50.52 | 326.60 |
| Point Bar | 0.20 | 0.21 | 0.41 | 0.20 | 0.09 | 0.82 | 1.93 |
| Rip-rap* | 0.00 | 0.35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 |
| Tailings Piles* | 5.33 | 0.44 | 1.18 | 0.44 | 0.00 | 5.06 | 12.45 |
| Terrace | 0.86 | 0.76 | 0.29 | 0.59 | 2.19 | 9.40 | 14.09 |
| Upland Hillslope | 23.36 | 13.36 | 17.39 | 17.67 | 4.87 | 43.31 | 119.96 |
| Water | 9.56 | 18.40 | 13.56 | 5.30 | 7.58 | 14.45 | 68.85 |
| **Total** | **103.39** | **91.54** | **211.79** | **43.68** | **22.48** | **135.13** | **608.01** |

* = Human induced geomorphic feature

### *Site-Specific Fluvial Geomorphology*

## Sawmill

Modified terrace deposits dominate the geomorphic features of the SM site and occupy both sides of the river (Figure 7.3-1a). This section of the river contains two obvious meanders. The furthest upstream meander is an abrupt ninety-degree bedrock-controlled feature that redirects the river from the west to the north. A second bedrock controlled meander (Trinity River Restoration Program 2007) is located approximately 2,000 feet downstream and redirects river flow slightly towards the west. The river banks between these meanders are dominated by riparian berms, primarily in the northern half of the reach. The river is confined by steep slopes along the left bank throughout most of the site. The dominant feature along the right bank is the Cemetery Side Channel Complex, which is a series of side channels that were constructed by Reclamation during the 1980s. This construction project excavated dredge tailings and placed them adjacent to the constructed side channel, intermittently entrenching it. Excavated dredge tailings were also used to construct in-stream grade control structures in the main channel of the Trinity River parallel to the constructed side channel complex. These structures are oriented perpendicular to streamflow and span the width of the channel. Four grade control structures are still visible on aerial photographs of the site. Dredge tailings also occupy a large area in the uplands to the west of the

upstream extent of this side channel complex. Of the Remaining Phase 1 sites, the SM site contains the largest area covered by tailings, approximately 5 acres.

The SM site shares a common site boundary with the UR site. These sites are hydrologically associated due to their spatial proximity to one another. The post-TRD hydrology of the Trinity River and historic rehabilitation efforts have formed the current geomorphic environments at both sites. Any alteration of hydrologic regime at the SM site will likely affect the UR site over time.

## Upper Rush Creek

The UR site occupies the upstream portion of a large-scale meander of the Trinity River (Figure 7.3-1b). The downstream boundary of the site coincides with the confluence of Rush Creek and the Trinity River, where extensive series of deltaic deposits persist. Floodplain deposits occupy both sides of the active channel in the upstream portion of the site, but the width of the active channel increases as it approaches the Rush Creek delta. The delta at the mouth of Rush Creek functions as a hydraulic control, influencing the large glide that extends approximately 2,000 feet upstream into the site. This low gradient feature lacks sinuosity but offers complexity in the form of islands, side channels, and riparian wetlands. In the 1980s, Reclamation modified the Rush Creek delta by constructing a side channel along the left bank downstream, almost to Salt Flat. The original intent of this side channel was to enhance the off-channel rearing habitat below the Rush Creek delta. Its functionality has diminished over time and ongoing fluvial processes have resulted in the reforming of the deltaic features, preventing the river from occupying this side channel during typical baseflow conditions.

The UR site includes a number of residences, recreational facilities, and roads. Some of these improvements are located below the OHW established for post-ROD flows (6,000 cfs). Historic dredge tailing deposits are also located at the OHW at several locations within the site. A majority of the development within the site has occurred along the right bank, near the upstream boundary. Residential dwellings constitute most of the development, but BLM does manage a small parking area adjacent to an unimproved boat ramp upstream of Rush Creek adjacent to Rush Creek Road.

## Lowden Ranch

Within the LR site, the Trinity River has been simplified over time as a result of historic land use activities, including mining and various types of agriculture. Some meander features can be identified upstream of the confluence with Grass Valley Creek near the Hamilton Ponds. The right side of the river is confined by upland features, while the left side is occupied by a large floodplain/terrace feature upstream from Grass Valley Creek. The depositional environment associated with the Grass Valley Creek delta has resulted in a hydraulic control that has formed the alluvial deposits observed within the site. Adjacent to the active channel, sparsely-vegetated floodplain deposits are located on both sides of the river in the upstream third of the site, and vegetated floodplain deposits are located on the right bank of the meander near the downstream boundary. The majority of the LR site, specifically on river left, occupies modified river terrace deposits (Figure 7.3-1c). Historic dredge tailing deposits are evident, as well as piles of fine sediment that is excavated from the Hamilton Ponds on a routine basis. While Grass Valley Creek enters the mainstem Trinity River downstream of the site, the reach of Grass Valley Creek

between the Hamilton Ponds and the mouth are included within the LR site. Over time, a levee system has been constructed by private parties along both sides of Grass Valley Creek, and in this reach Grass Valley Creek exhibits characteristics of a braided stream channel; flowing around in-channel gravel bar and point bar deposits adjacent to the banks of the active channel. The abundance of point bars and the extent of deltaic sediment downstream suggest that the tributary continues to transport measurable amounts of sediment into the main stem of the Trinity River despite the efficiency of the Hamilton Ponds immediately upstream. Several residential structures are located near the site boundary, but it appears that the only constructed features within the site boundaries are roads and driveways.

## Trinity House Gulch

The THG site represents an extension of the fluvial processes observed immediately upstream at the LR site, and in fact these sites are intrinsically linked due to their spatial relationship. For example, the mouth of Grass Valley Creek and the associated delta are located within the THG site, but the reach of Grass Valley Creek between the Hamilton Ponds and the confluence delta is located within the LR site; and sediment transported in Grass Valley Creek is deposited in the delta and the riverine segment within the THG site.

The mainstem Trinity River flows east to west through most of the site but begins to meander to the southwest near the downstream site boundary. The main feature of the site is a lobe of modified terrace deposits located along the right bank of the river near the downstream end of the site (Figure 7.3-1d). This lobe is believed to be composed of a pre-dam point-bar-like deposit that was either a point bar modified by mining activity and/or fluvially reworked tailings. Adjacent to the northwest flank of the lobe is a small deltaic feature at the mouth of Trinity House Gulch. The amount and character of vegetation on this feature suggest that post-ROD flows have not been effective in modifying this feature to-date. In fact, the morphological mapping suggests that this feature is expanding towards the river. There are thin ribbons of existing vegetated floodplain deposits along both sides of the river. A small point bar deposit is present on the left bank, near the western boundary of the site. There are at least two residential structures and associated access roads within the boundary of this site. One access road emanates from the Hamilton Ponds and parallels the left bank towards the LR site. Browns Mountain Road serves as the northern boundary for the site. Several private roads access portions of the site along the right bank.

## Steel Bridge Day Use

The SB site is the smallest of the Remaining Phase 1 sites. Located on the left bank, it occupies a portion of a large meander that winds from south to east in the mainstem Trinity River. A large island of floodplain deposits is located in the main channel approximately 20 feet upstream from the beginning of the meander. The site is comprised of approximately equal amounts of floodplain deposits, terrace deposits, and upland hillslope (Figure 7.3-1e). The right bank of the river is controlled by a steep hill slope that is contiguous with the uplands. Isolated riparian berms have formed on the left bank. To some degree, these berms have isolated the river from the floodplain deposits under certain flows; thus, decreasing the opportunity for deposition and scour. It appears that over time, floodplain deposits have migrated towards the thalweg within this site and have partially separated the vegetated berm from

flowing water. The growth of these floodplain deposits has increased friction to the flow of the mainstem during high flows events, and has likely accelerated the deposition of coarse sediment at this site.

### Reading Creek

The RC site occupies a long (approximately 6,000 feet) southwest to northeast trending meander that is confined by a relatively steep valley wall on the left bank, particularly downstream from the confluence of Reading Creek (Figure 7.3-1f). On the river left, the mouth of Reading Creek enters from the southeast near RM 92.9, and a small delta is located at the confluence with the river. A large portion of the site is overlain by dredge tailing deposits or other topographic features associated with historic mining activities. Upstream of Reading Creek, the river is confined, in part by large tailing deposits on both sides. Riparian berms have developed along the inside of the meander downstream of Reading Creek. To varying degrees, these berms extend downstream to the site boundary.

The RC site has the largest area of riparian berms and point bars. A majority of the coarse sediment bar deposits occur downstream from the mouth of Reading Creek. This fact coupled with the presence of a deltaic deposit at the mouth of Reading Creek suggests that Reading Creek is a significant contributor of sediment to the mainstem Trinity River. Prior to the ROD, reduction of peak flows by the TRD may have inhibited the transport of coarse sediment through this reach.

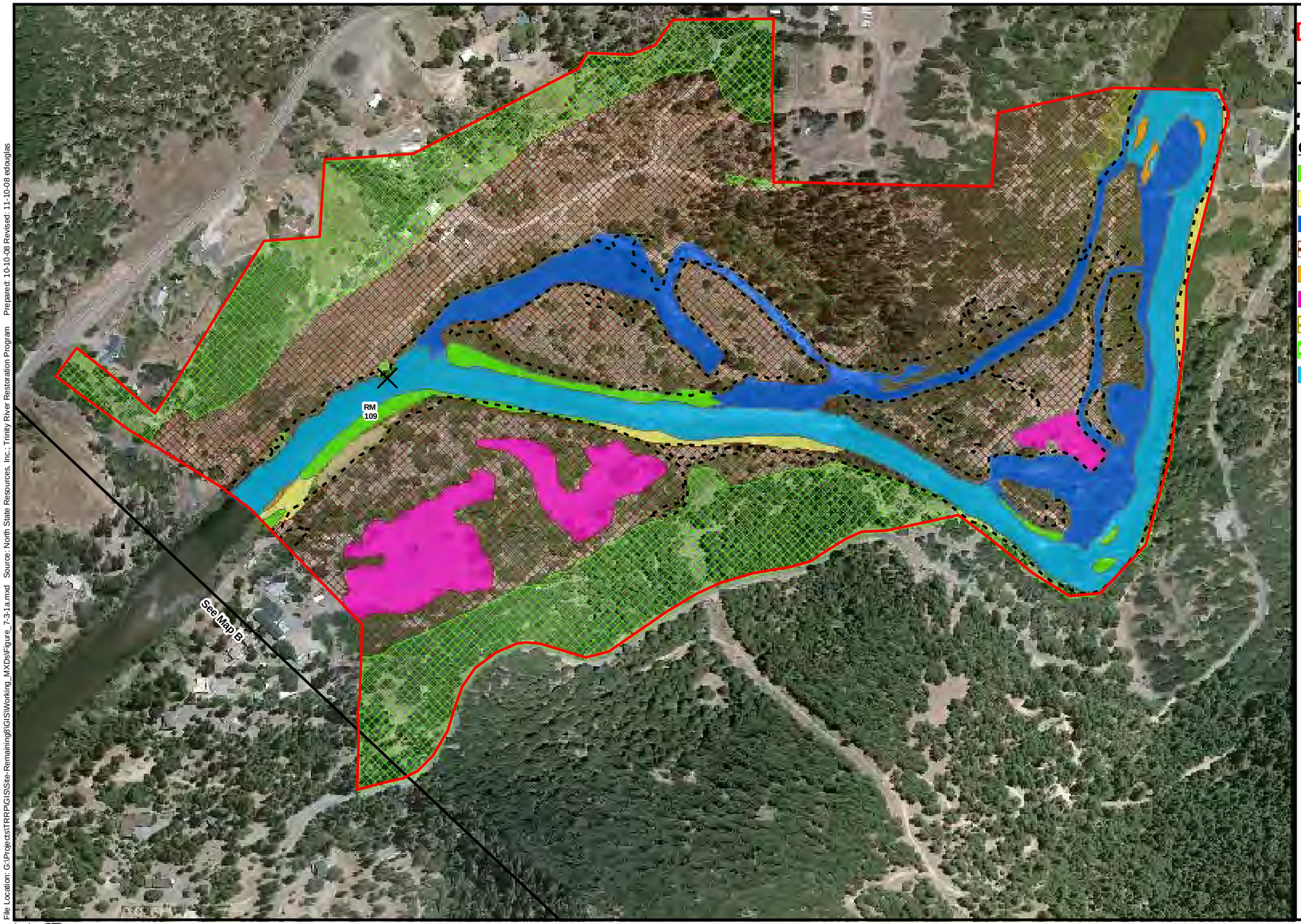
## Mines and Mineral Resources

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, by a variety of methods, from the advent of European settlement to the present.

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.

Recent and ancient alluvial deposits were extensively mined until the 1940s using a variety of techniques. The hydraulic mining operations used high-pressure water to erode and mobilize large quantities of unconsolidated overburden from gold-bearing areas. Evidence of this activity can be seen at various locations within the reach, including the SM and RC sites. 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 Remaining Phase 1 sites described in the Master EIR (Chapter 2). The SM, UR, LR, and RC sites have large volumes of dredge tailings that are artifacts of this mining era.

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




Site Boundary (103.421 acres)
River Mile (RM)
Matchline
Ordinary High Water Mark (OHWM) - 6000 cfs

**Geomorphic Feature**

- Berm (1.582 acres)
- Floodplain (1.256 acres)
- Modified Floodplain (8.980 acres)
- Modified Terrace (52.293 acres)
- Point Bar (0.196 acre)
- Tailings Piles (5.332 acres)
- Terrace (0.856 acre)
- Upland Hillslope (23.363 acres)
- Water (9.563 acres)

N

1:3,600

300 0 300
Feet

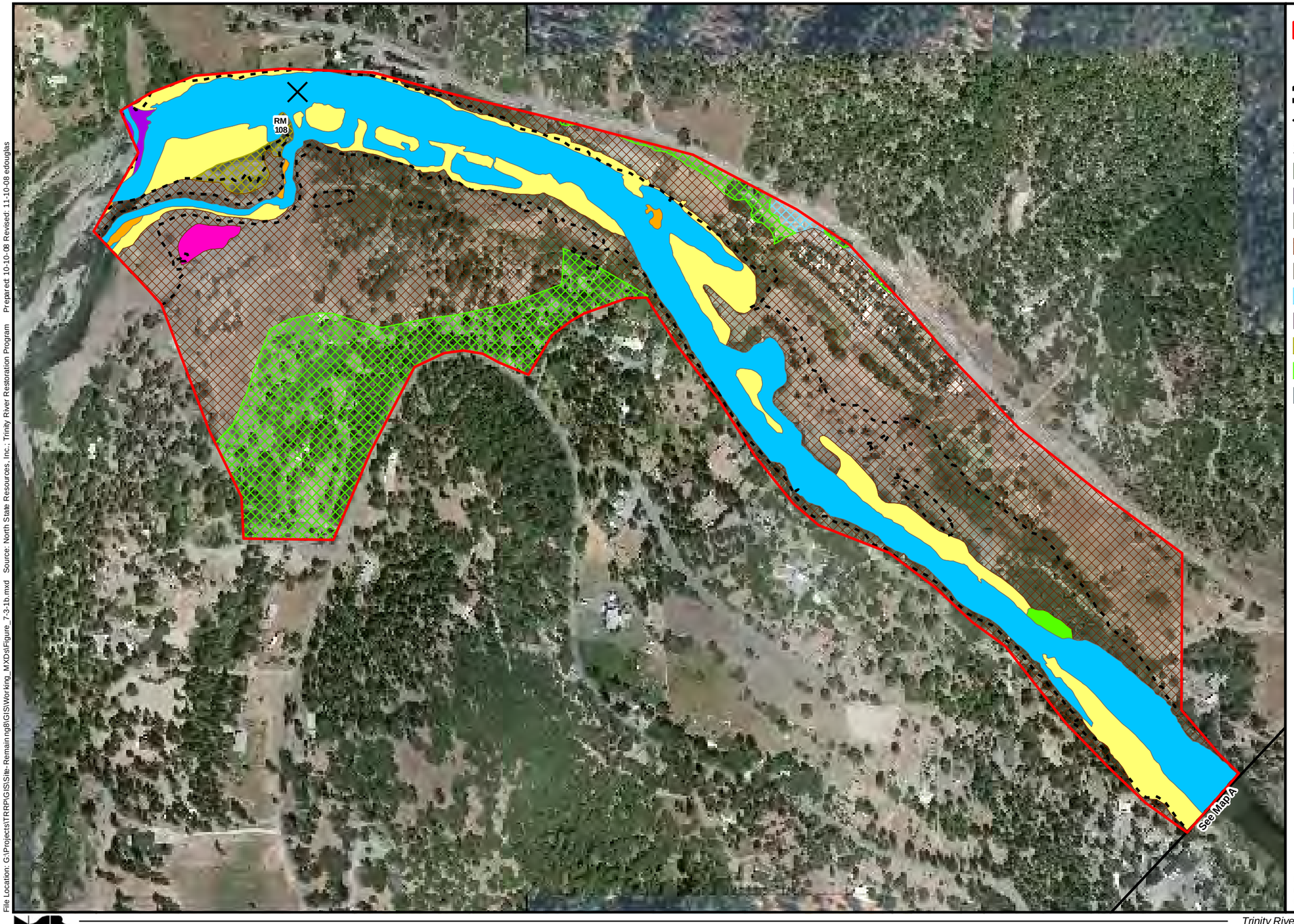
**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7-3-1a.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-10-08 Revised: 11-10-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.3-1a**
**Sawmill - Mapped Geomorphic Features**




Site Boundary (92.274 acres)
River Mile (RM)
Ordinary High Water Mark (OHWM) - 6000 cfs
Matchline

**Geomorphic Feature**

- Berm (0.213 acre)
- Delta (0.221 acre)
- Floodplain (9.033 acres)
- Modified Terrace (49.263 acres)
- Point Bar (0.216 acre)
- Rip-rap (0.346 acre)
- Tailings Piles (0.443 acre)
- Terrace (0.757 acre)
- Upland Hillslope (13.364 acres)
- Water (18.418 acres)

N

1:4,200

350 0 350
Feet

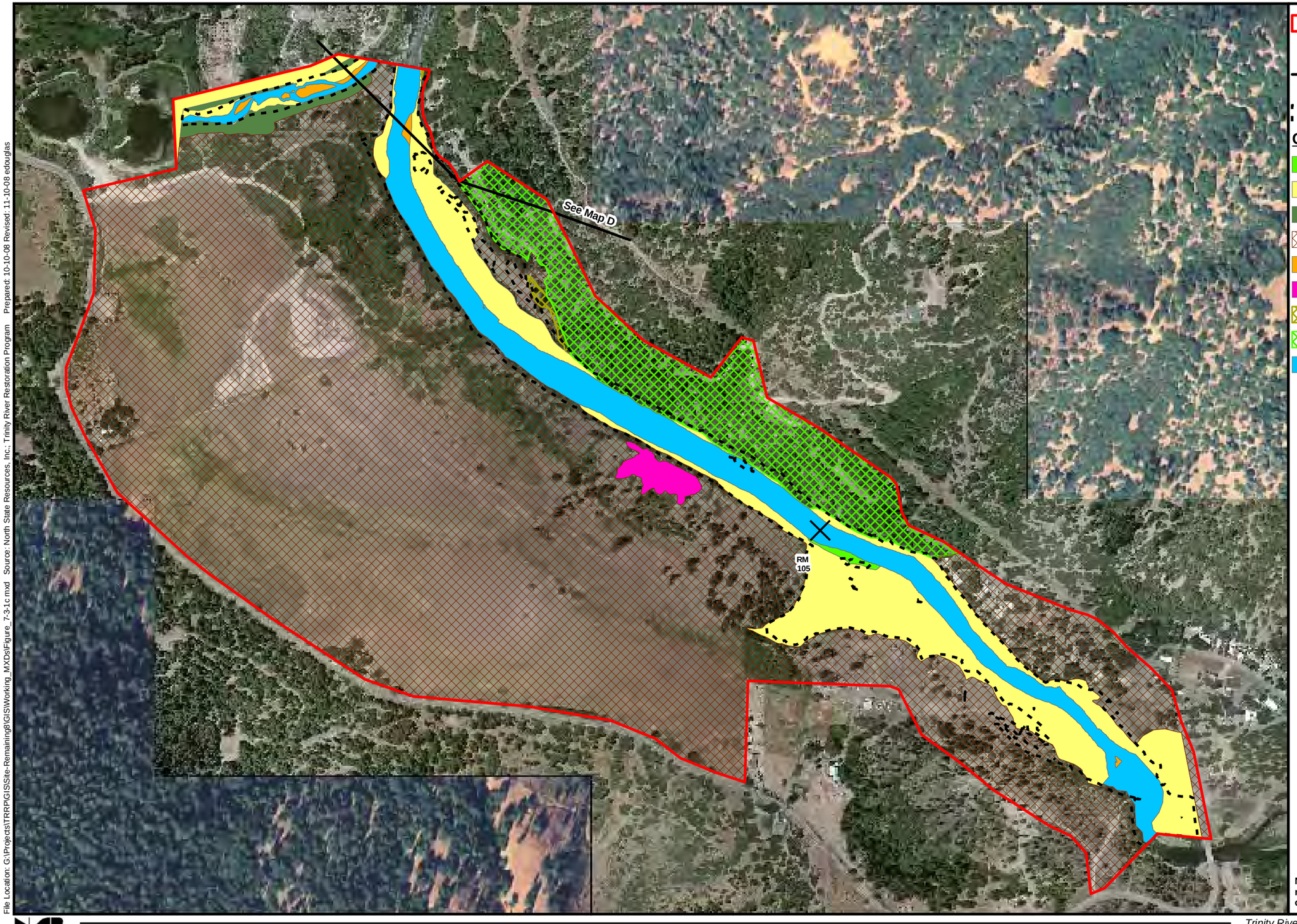
**Note: Legend symbol swatches do not necessary reflect map symbology based on rotation angle of north angle.**

File Location: G:\Projects\TRRP\GIS\Site- Remaining\GIS\Working_MXDs\Figure_7-3-1b.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-10-08 Revised: 11-10-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.3-1b**
**Upper Rush Creek - Mapped Geomorphic Features**




**Site Boundary (211.769 acres)**
River Mile (RM)
Matchline
Ordinary High Water Mark (OHWM) - 6000 cfs

**Geomorphic Feature**

- Berm (0.212 acre)
- Floodplain (19.920 acres)
- Levee (1.541 acres)
- Modified Terrace (157.079 acres)
- Point Bar (0.405 acre)
- Tailings Piles (1.178 acres)
- Terrace (0.289 acre)
- Upland Hillslope (17.589 acres)
- Water (13.556 acres)

N

1:5,400

450 0 450
Feet

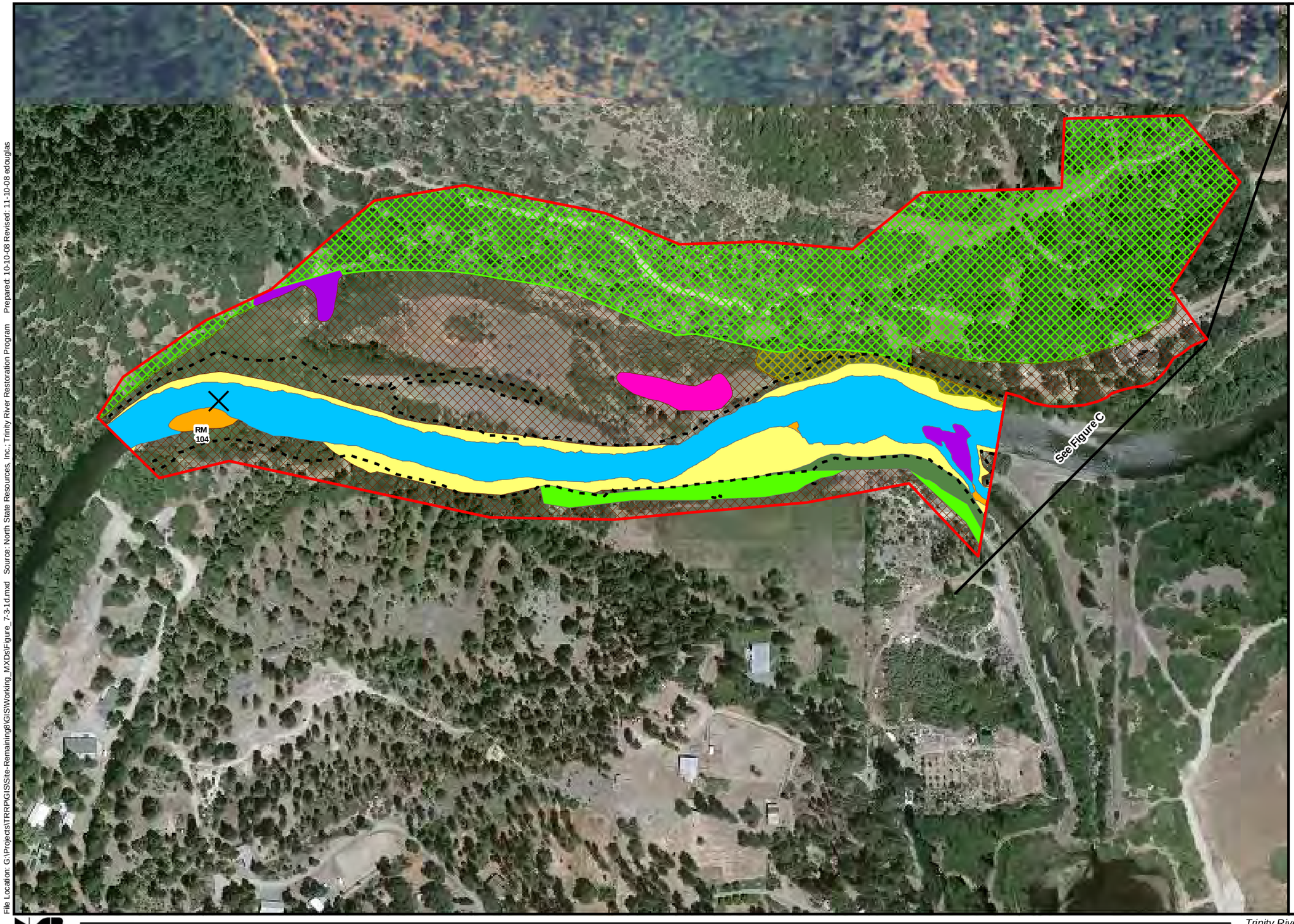
**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining\GIS\Working_MXDs\Figure_7-3-1c.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-10-08 Revised: 11-10-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.3-1c**
**Lowden Ranch - Mapped Geomorphic Features**




Site Boundary (43.695 acres)
River Mile (RM)
Matchline
Ordinary High Water Mark (OHWM) - 6000 cfs

**Geomorphic Feature**

- Berm (0.833 acre)
- Delta (0.428 acre)
- Floodplain (2.870 acres)
- Levee (0.451 acre)
- Modified Terrace (14.900 acres)
- Point Bar (0.201 acre)
- Tailings Piles (0.436 acre)
- Terrace (0.587 acre)
- Upland Hillslope (17.690 acres)
- Water (5.299 acres)

N

1:3,000

250 0 250
Feet

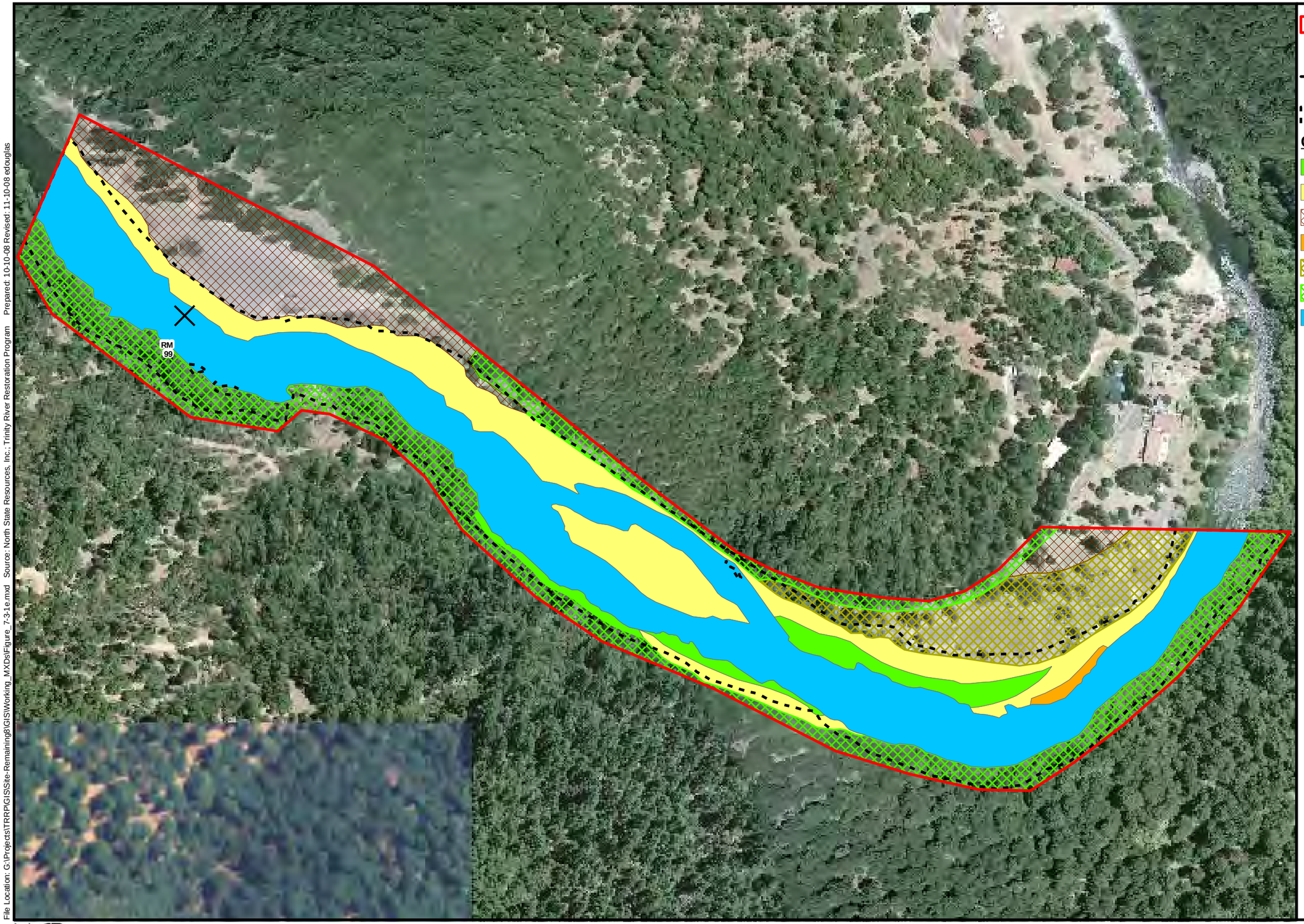
**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7-3-1d.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-10-08 Revised: 11-10-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.3-1d**
**Trinity House Gulch - Mapped Geomorphic Features**




Site Boundary (22.475 acres)
River Mile (RM)
Matchline
Ordinary High Water Mark (OHWM) - 6000 cfs

**Geomorphic Feature**

Berm (0.775 acre)
Floodplain (3.733 acres)
Modified Terrace (3.244 acres)
Point Bar (0.089 acre)
Terrace (2.192 acres)
Upland Hillslope (4.866 acres)
Water (7.576 acres)

N

1:2,400

200 0 200
Feet

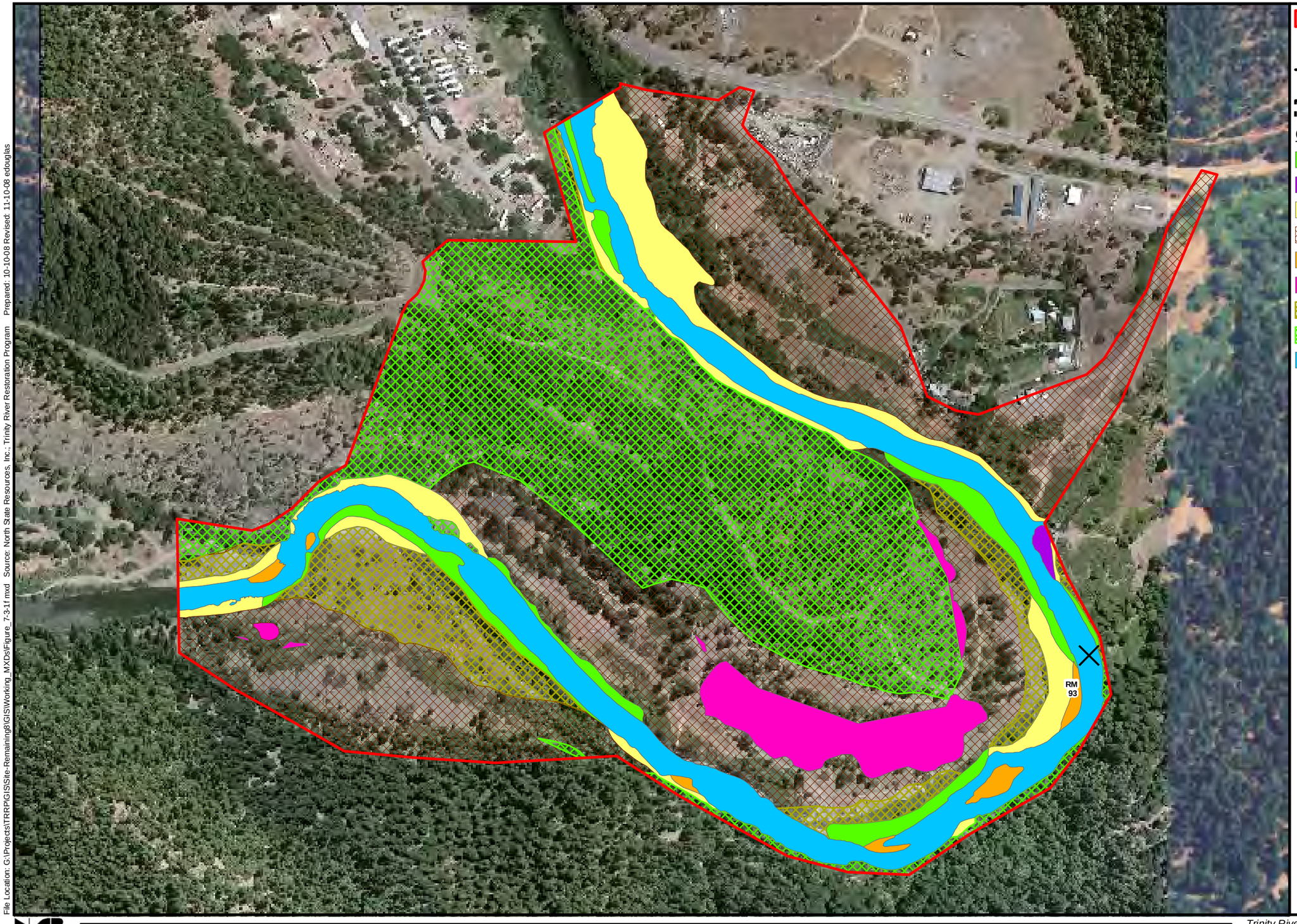
**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining\GIS\Working_MXDs\Figure_7-3-1e.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-10-08 Revised: 11-10-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.3-1e**
**Steel Bridge Day Use - Mapped Geomorphic Features**




Site Boundary (135.871 acres)
River Mile (RM)
Matchline
Ordinary High Water Mark (OHWM) - 6000 cfs

**Geomorphic Feature**

- Berm (3.819 acres)
- Delta (0.194 acre)
- Floodplain (7.587 acres)
- Modified Terrace (50.519 acres)
- Point Bar (0.817 acre)
- Tailings Piles (5.064 acres)
- Terrace (9.406 acres)
- Upland Hillslope (43.978 acres)
- Water (14.487 acres)

N

1:4,200

350 0 350
Feet

**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7.3-1f.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-10-08 Revised: 11-10-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.3-1f**
**Reading Creek - Mapped Geomorphic Features**

deposits and reworking of hydraulic tailings have resulted in additional channel modifications and changes in sediment supply.

### *Mining Activity*

Current records indicate that there are 11 active mining claims located within, or close to, the Remaining Phase 1 sites (U.S. Bureau of Land Management 2008). One claim is located within the boundaries of the RC site, and 10 claims are located less than two river-miles downstream of one or more Remaining Phase 1 sites. According to BLM records, most of these claims are filed as placer in nature. Under the 1872 Mining Law, 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, the Remaining Phase 1 sites; although, suction dredging does occur at various locations along the Trinity River. Suction dredging is the principal mining method used on the Trinity River, and typically occurs on mining claims and private lands throughout Trinity County during base-flow periods.

There are currently no approved mining activities operating under the sanctions of the 1872 mining law or a County Surface Mining and Reclamation Act (SMARA) permit within, or close to, the Remaining Phase 1 sites. There are, however, two permitted aggregate mining operations, the Eagle and the Smith mines, operating in the general vicinity of the Trinity River under Trinity County's SMARA authority. 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, in the vicinity of Hocker Flat, is currently inactive (Smith, pers. comm. 2008).

Rehabilitation activities at the RC site have the potential to affect the greatest number of active mining claims because this site is located less than 2 river-miles downstream of nine active mining sites, and five of the nine sites are located within 1 river mile of the RC site. Additionally, one claim, the Dennis Ray McCoy mining claim, is located within the boundaries of the RC site.

## Geologic Hazards

### *Seismicity and Seismic Hazards*

A discussion of the regional seismicity and seismic hazards is provided in the Master EIR (section 4.3).

An earthquake with a magnitude of 8.5 or greater would be needed to induce seismic hazards at the Remaining Phase 1 sites (California Geologic Survey 2008). All of the Remaining Phase 1 sites are 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.

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 several small pre-Quaternary faults located less than 1 mile south of the Trinity River between the LR and SB sites.

### *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 the Trinity River in immediate proximity to the Remaining Phase 1 sites are predominantly alluvial in nature. These soils have the potential to experience liquefaction; however, no detailed analysis was conducted because the type of activities described in Chapter 2 would not affect the potential for liquefaction or be affected by liquefaction were it to occur.

### *Landslides*

The potential for landslides exists within, or close to, the Remaining Phase 1 sites. Typically, landslides in the Klamath Mountains Province occur in association with high precipitation and runoff events. To varying degrees, the inherent slope stability at these sites along the reach is dependent on the underlying geology. The underlying geology of the Remaining Phase 1 sites 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. This suggests landslides in the area may occur along planes of structural weakness within metamorphic geologic units rather than occurring based solely on their topographic disposition. Additionally, disturbance associated with historic mining features, road construction, and high-intensity wildfire could further influence landslide types and locations at the Remaining Phase 1 sites. Although landslides are a common occurrence along roadways in Trinity County, these features are typically intercepted by the roadbed and contribute little, if any, material to the mainstem Trinity River.

### *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 resultant modifications to the flow regime of the Trinity River (i.e., flooding). However, the likelihood of such an event occurring at any of the Remaining Phase 1 sites is minimal.

### *Volcanic Activity*

Volcanic hazards in the general vicinity of the Remaining Phase 1 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 that a volcanic eruption would have little impact to the any of the Remaining Phase 1 sites (Trinity County 2003).

### *Soils*

The majority of the soils at the Remaining Phase 1 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 (U.S. Department of Agriculture 2008). A comprehensive list of the soils associated with each of the Remaining Phase 1 sites is provided in Appendix L.

Soils derived from granitic rocks are typically fine-grained and commonly referred to as decomposed granite "DG". These soils occur in isolated locations at the Remaining Phase 1 sites and 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. Historic deposition of granitic sediments at the mouth of Grass Valley Creek has likely influenced the soil composition and texture near the LR and THG sites, as well as other sites downstream.

## 7.3.2 Environmental Consequences/Impacts and Mitigation Measures

Table 7.3-2 summarizes the potential geology, fluvial geomorphology, minerals and soils impacts that would result from the No-Project Alternative, the Proposed Project, and Alternative 1.

**Table 7.3-2. 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 7.3-1. 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 7.3-2. 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 7.3-3. 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 7.3-1: 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. Thus, there would be no 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 7.3-2: 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. Therefore, no construction-related erosion or associated sedimentation of the Trinity River would occur, and there would be no impact.

### *Proposed Project*

Implementation of the Proposed Project at any of the Remaining Phase 1 sites has a significant potential to increase erosion and subsequent short-term sedimentation of the Trinity River. The significance of erosion at each site would likely be influenced by the following:

- the extent that disturbed soils are exposed to flowing water;
- the extent that disturbed soils are exposed to energetic weather conditions; and
- the extent of soil compaction and associated runoff.

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). At these locations, the exposure of these fine-textured soils during and after construction occurs will increase the potential for soil erosion and sedimentation. Impacts of turbidity levels specific

to water quality degradation are analyzed in sections 4.5 and 7.5, Water Quality, and associated impacts to anadromous fisheries are analyzed in sections 4.6 and 7.6, Fishery Resources.

A majority of the rehabilitation activities would occur in, or in close proximity to, flowing water associated with the affected reach of the mainstem Trinity River and its tributaries, and could expose newly disturbed and/or stable sediments and other alluvial materials to flowing water. Specifically, in-channel activities (i.e., stream crossing construction/use, grade control removal, LWD placement) and riverine rehabilitation activities (low-flow side channel construction, floodplain construction, and riparian vegetation removal) would likely disturb areas in proximity 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; an increase in turbidity levels downstream (varying distances); and changes to type, volume and character of deposition downstream. Monitoring results from previous TRRP channel rehabilitation projects (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 remain elevated for a longer duration as diurnal and seasonal fluctuations in hydrologic conditions further shape the disrupted area into a more stable geometry.

Construction activities in the river (e.g., floodplain construction and mechanical vegetation removal) and the uplands (e.g., construction of staging areas and staging of excavated sediment) has the potential to significantly decrease soil cohesion and armoring; thus, increasing soil exposure to energetic weather conditions and increasing the short-term potential for wind and water erosion. Increased wind and water erosion and subsequent downstream sediment transport in the Trinity River would occur if any soils were left exposed during the wet season (typically November through May) and other infrequent precipitation events (summer thunderstorms).

The use of heavy equipment for restoration activities will likely increase soil compaction; potentially causing surface water runoff. An increase in the volume of surface water runoff increases the potential for erosion. Thus, any significant increase in soil compaction will cause a potentially significant increase in erosion. Therefore, this impact is significant.

**Table 7.3-3. Extent of Disturbance for the Proposed Project and Alternative 1**

| Site | Project | Stream Crossings (miles) | In-Channel (acres) | Riverine (acres) | Upland (acres) | Roads (miles) | Staging Areas (acres) |
|---|---|---|---|---|---|---|---|
| SM | Proposed Project | 0.04 | 3.3 | 15.1 | 3.6 | 0.9 | 10.4 |
| | Alternative 1 | 0.04 | 3.3 | 15.1 | 3.6 | 0.9 | 10.4 |
| UR | Proposed Project | 0.02 | 2.4 | 8.6 | 3.1 | 1.0 | 4.1 |
| | Alternative 1 | 0.00 | 1.6 | 4.8 | 1.7 | 0.7 | 2.3 |

**Table 7.3-3. Extent of Disturbance for the Proposed Project and Alternative 1**

| Site | Project | Stream Crossings (miles) | In-Channel (acres) | Riverine (acres) | Upland (acres) | Roads (miles) | Staging Areas (acres) |
|---|---|---|---|---|---|---|---|
| LR | Proposed Project | 0.03 | 2.8 | 32.0 | 67.6 | 1.5 | 8.8 |
| | Alternative 1 | 0.01 | 2.6 | 27.4 | 64.0 | 1.0 | 4.8 |
| THG | Proposed Project | 0.06 | 0.8 | 6.1 | 6.5 | 0.5 | 1.7 |
| | Alternative 1 | 0.06 | 0.8 | 6.1 | 2.8 | 0.4 | 0.7 |
| SB | Proposed Project | 0.00 | 0.7 | 2.7 | 0.3 | 0.5 | 2.5 |
| | Alternative 1 | 0.00 | 0.5 | 2.7 | 0.3 | 0.2 | 0.9 |
| RC | Proposed Project | 0.01 | 1.5 | 15.4 | 9.2 | 2.1 | 6.5 |
| | Alternative 1 | 0.00 | 1.5 | 10.9 | 7.1 | 1.3 | 2.9 |

### *Alternative 1*

Implementation of Alternative 1 at any of the Remaining Phase 1 sites has a significant potential to increase erosion and subsequent short-term sedimentation of the Trinity River. The potential for erosion is determined using the same factors that were used to evaluate the Proposed Project.

Compared to the Proposed Project, implementation of Alternative 1 would decrease the extent and number of rehabilitation activities at each Remaining Phase 1 site except SM. Table 7.3-3 compares the disturbed area within each site by activity type for the Proposed Project and Alternative 1. Data in the table clearly indicates that Alternative 1 decreases the extent of the disturbed area in most of the Remaining Phase 1 sites. However, the potential for erosion remains significant due to the proximity of construction disturbance to flowing water, exposure of disturbed areas to energetic weather conditions, and soil compaction due to heavy equipment use. Therefore, this impact is 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*

Mitigation measures detailed under the Master EIR Impact 4.3-2 apply (section 4.3.2). No additional mitigation measures are required.

## Significance after Mitigation

Less than significant

**Impact 7.3-3: Implementation of the project would interfere with existing, proposed, or potential development of mineral resources.** ***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 project would not be constructed. Therefore, no interference with existing, proposed, or potential development of mineral resources would occur, and there would be no impact.

### *Proposed Project*

The development of mineral resources would be inhibited if a mining claim occupies a rehabilitation site, or if rehabilitation activities cause a dramatic increase of sediment levels in the Trinity River, causing placer mining downstream to be unworkable for a period of time. There are two current aggregate mining activities operating through a County SMARA permit, the Eagle Mine and the Smith Mine, although the Smith mine is not actively excavating material (Smith, pers. comm. 2008). The Eagle Mine is not located within hydrologic influence of the Trinity River and will not likely be affected by the Proposed Project. Additionally, there are at least 11 mining claims staked on lands managed by BLM. Currently, BLM has no authorized operating plans for public lands along this reach of the Trinity River. All of the mining claims are located downstream from at least one of the Remaining Phase 1 sites One active mining claim is located within the boundaries of the RC site. Mining activities are likely to occur on private lands within this reach; however, it is unlikely that land owners would authorize activities associated with the Proposed Project that preclude their ability to conduct mining activities. Overall, the Proposed Project could inhibit the development and extraction of mineral resources, including precious metals and aggregate resources within, and close to, rehabilitation sites. This would be a significant impact.

### *Alternative 1*

Under Alternative 1, the location, number, and magnitude of activities would decrease within the Remaining Phase 1 sites. The overall reduction of activities, including a substantial decrease in the overall acres and volume of material, will reduce the impacts related to the development and extraction of mineral resources. However, the potential conflicts between mineral management and rehabilitation activities could result in a significant impact.

## Mitigation Measures

### *No-Project Alternative*

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

### *Proposed Project and Alternative 1*

Mitigation measures detailed under the Master EIR Impact 4.3-3 apply (section 4.3.2). No additional mitigation measures are required.

## Significance after Mitigation

Less than significant

SECTION 7.4

# Water Resources

# 7.4 Water Resources

This section is a discussion of the water resources known to occur in the Trinity River Basin in proximity to the proposed Remaining Phase 1 mechanical channel restoration sites along the Trinity River. It also evaluates potential impacts to water resources from implementation of the Proposed Project and alternatives.

## 7.4.1 Affected Environment/Environmental Setting

The affected environment for water resources is addressed in the Master EIR (section 4.4).

## 7.4.2 Environmental Consequences/Impacts and Mitigation Measures

Table 7.4-1 summarizes the potential water resources impacts that could result from construction of the project.

**Table 7.4-1. Summary of Potential Water 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 7.4-1. 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] |
| Impact 7.4-2. 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 7.4-3. 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 potential impact is less than significant, no mitigation is required

**Impact 7.4-1: Implementation of the project could result in a temporary or permanent increase in the base floodwater elevation.** ***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 and the existing BFEs would not change because the project would not be constructed. Therefore, there would be no impact.

### *Proposed Project and Alternative 1*

This impact is evaluated in detail in the Master EIR (section 4.4.2). No additional impacts at the Remaining Phase 1 sites have been identified. This impact is 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 7.4-2: Implementation of the project could result in a permanent decline in groundwater elevations or permanent changes 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, 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*

This impact is evaluated in detail in the Master EIR (section 4.4.2). No additional impacts at the Remaining Phase 1 sites have been identified. This impact is 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 7.4-3: 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, 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*

This impact is evaluated in detail in the Master EIR (section 4.4.2). No additional impacts at the Remaining Phase 1 sites have been identified. This impact is less than significant.

## Mitigation Measures

### *No-Project Alternative, Proposed Project, and Alternative 1*

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

## Significance after Mitigation

Not applicable

SECTION 7.5

# Water Quality

# 7.5 Water Quality

This section describes water quality conditions in the Trinity River Basin in proximity to the Remaining Phase 1 rehabilitation sites along the Trinity River. It also evaluates potential impacts to water quality from implementation of the Proposed Project and its alternatives.

## 7.5.1 Affected Environment/Environmental Setting

Rehabilitation activities at all of the Remaining Phase 1 sites would occur in or adjacent to the Trinity River. For the past four years, the TRRP has implemented these types of activities in conjunction with the Hocker Flat, Canyon Creek, Indian Creek, and Lewiston-Dark Gulch projects. While the type and intensity of these activities varied, the affects of these activities on water quality in the Trinity River is well understood. Within all the Remaining Phase 1 sites (Table 7.5-1), a majority of the proposed rehabilitation activities would occur in (i.e., Stream crossings or In-channel activities) or adjacent to (i.e., Riverine activities) the Trinity River, and a smaller portion would occur in the uplands. Specific rehabilitation activities proposed for each site are described in Chapter 2 of the Master EIR. Short distances between restoration activities and flowing water, including shallow alluvial groundwater, magnifies the potential for rehabilitation activities to adversely impact the water quality of the Trinity River.

Table 7.5-1 illustrates the type and size of the activities considered for the Remaining Phase 1 sites. Overall, LR is the largest of these sites, followed by the RC, SM, URC, THG, and SB sites, respectively.

**Table 7.5-1. Activity Areas – Remaining Phase 1 Sites**

| Site | Stream Crossings (miles) | In-Channel (acres) | Rivervine (acres) | Upland (acres) | Roads (miles) |
|---|---|---|---|---|---|
| Sawmill | 0.04 | 3.3 | 15.1 | 3.6 | 0.9 |
| Upper Rush Creek | 0.02 | 2.4 | 8.6 | 3.1 | 1.0 |
| Lowden Ranch | 0.03 | 2.8 | 32.0 | 67.6 | 1.5 |
| Trinity House Gulch | 0.06 | 0.8 | 6.1 | 6.5 | 0.5 |
| Steel Bridge Day Use | 0.00 | 0.7 | 2.7 | 0.3 | 0.5 |
| Reading Creek | 0.01 | 1.5 | 15.4 | 9.2 | 2.1 |

Additional information on the affected environment as it relates to water quality is provide in the Master EIR, section 4.5, Water Quality.

## 7.5.2 Environmental Consequences/Impacts and Mitigation Measures

Table 7.5-2 summarizes the potential water quality impacts resulting from construction and operation of the project.

**Table 7.5-2. Summary of Potential Water Quality Impacts for the No-Project Alternative, Proposed Project, and Alternative 1**

| No-Action Alternative | Proposed Project | Alternative 1 | Proposed Project with Mitigation | Alternative 1 with Mitigation |
|---|---|---|---|---|
| Impact 7.5-1. 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 7.5-2. 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 7.5-3. 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 7.5-4. 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 7.5-5. 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 potential impact is less than significant, no mitigation is required.

**Impact 7.5-1: 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 and Alternative 1*

This impact is evaluated in detail in the Master EIR (section 4.5.3). No additional impacts at the Remaining Phase 1 sites have been identified. 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*

Mitigation measures detailed under the Master EIR Impact 4.5-1 apply (section 4.5.2). No additional mitigation measures are required.

## Significance after Mitigation

Less than significant

**Impact 7.5-2: 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 and Alternative 1*

This impact is evaluated in detail in the Master EIR (section 4.5.2) based on information outlined in Chapter 2. No additional impacts at the Remaining Phase 1 sites have been identified. 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*

Mitigation measures detailed under the Master EIR Impact 4.5-2 apply (section 4.5.2). No additional mitigation measures are required.

## Significance after Mitigation

Less than significant

**Impact 7.5-3: 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*

This impact is evaluated in detail in the Master EIR (section 4.5.2). No additional impacts at the Remaining Phase 1 sites have been identified. 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*

Mitigation measures detailed under the Master EIR Impact 4.5-3 apply (section 4.5.2). No additional mitigation measures are required.

## Significance after Mitigation

Less than significant

**Impact 7.5-4: Construction and maintenance 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*

This impact is evaluated in detail in the Master EIR (section 4.5.2). No additional impacts at the Remaining Phase 1 sites have been identified. 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 7.5-5: Construction and maintenance of the project could result in the degradation of Trinity River beneficial uses identified in the Basin Plan.** ***No impact 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*

This impact is evaluated in detail in the Master EIR (section 4.5.2). No additional impacts at the Remaining Phase 1 sites have been identified. This impact would be significant.

## Mitigation Measures

### *No-Project Alternative*

No significant impact was identified; therefore no mitigation is required

### *Proposed Project and Alternative 1*

Mitigation measures detailed under the Master EIR Impact 4.5-5 apply (section 4.5.2). No additional mitigation measures are required.

## Significance after Mitigation

Less than significant

SECTION 7.6

# Fishery Resources

# 7.6 Fishery Resources

This section describes the fishery resources and aquatic habitats that are known to occur within the boundaries of the Remaining Phase 1 sites and evaluates the impacts of the Proposed Project and alternatives on these resources. The discussion of fisheries resources is based on a focused literature review, informal consultation with resource agencies, and observations made during site visits.

## 7.6.1 Affected Environment/Environmental Setting

### Special-Status Species

Special-status fish species potentially occurring at the project sites are discussed in the Master EIR (section 4.6) and Appendix G. Based on site-specific information, their likelihood of occurrence at each of the Remaining Phase 1 sites is provided below.

#### *Local Aquatic Habitat*

The aquatic environment in the general vicinity of the Remaining Phase 1 sites is characterized by a sequence of aquatic mesohabitat types. Each of these habitat types consists of distinctive combinations of depth, water velocity, water temperature, cover, substrate composition (bedrock, cobble, gravel, sand, silt, etc.), and adjacent riparian vegetation.

Figures 7.6-1a-f illustrate aquatic mesohabitat as defined by the USFWS for the Remaining Phase 1 sites. Riparian vegetation directly adjacent to the river is referred to as shaded riverine aquatic (SRA) habitat and is included as a component of designated critical habitat for coho salmon, as well as a component of essential fish habitat (EFH) for both coho and Chinook salmon.

To varying degrees, the Remaining Phase 1 sites provide spawning habitat for anadromous salmonids. Suitable spawning habitat occurs in most of the riffles, particularly in the low-gradient riffles and tail-outs of pools and deep run/glide habitats. The quality and extent to which these habitats are used varies by site. Salmon spawner surveys in the upper Trinity River conducted annually by the CDFG (in cooperation with the YT, USFWS, and USFS) report that the greatest concentration of Chinook and coho salmon spawning occurs in the upper survey sections (Sections 1 and 2), which range from Lewiston Dam to Old Lewiston Bridge and Old Lewiston Bridge to Bucktail Bridge, respectively. Section 2 includes the SM and UR sites.

All of the Remaining Phase 1 sites provide some level of suitable habitat for salmonid rearing. Large cobbles and boulders provide suitable cover and refuge for rearing salmonids. To some degree, this substrate type occurs within each of the sites discussed in this section. Additionally, overhanging riparian and aquatic vegetation contributes shade and physical cover, enhancing the value of rearing habitat at these sites. Where available, site-specific observations of juvenile rearing habitat are provided below.

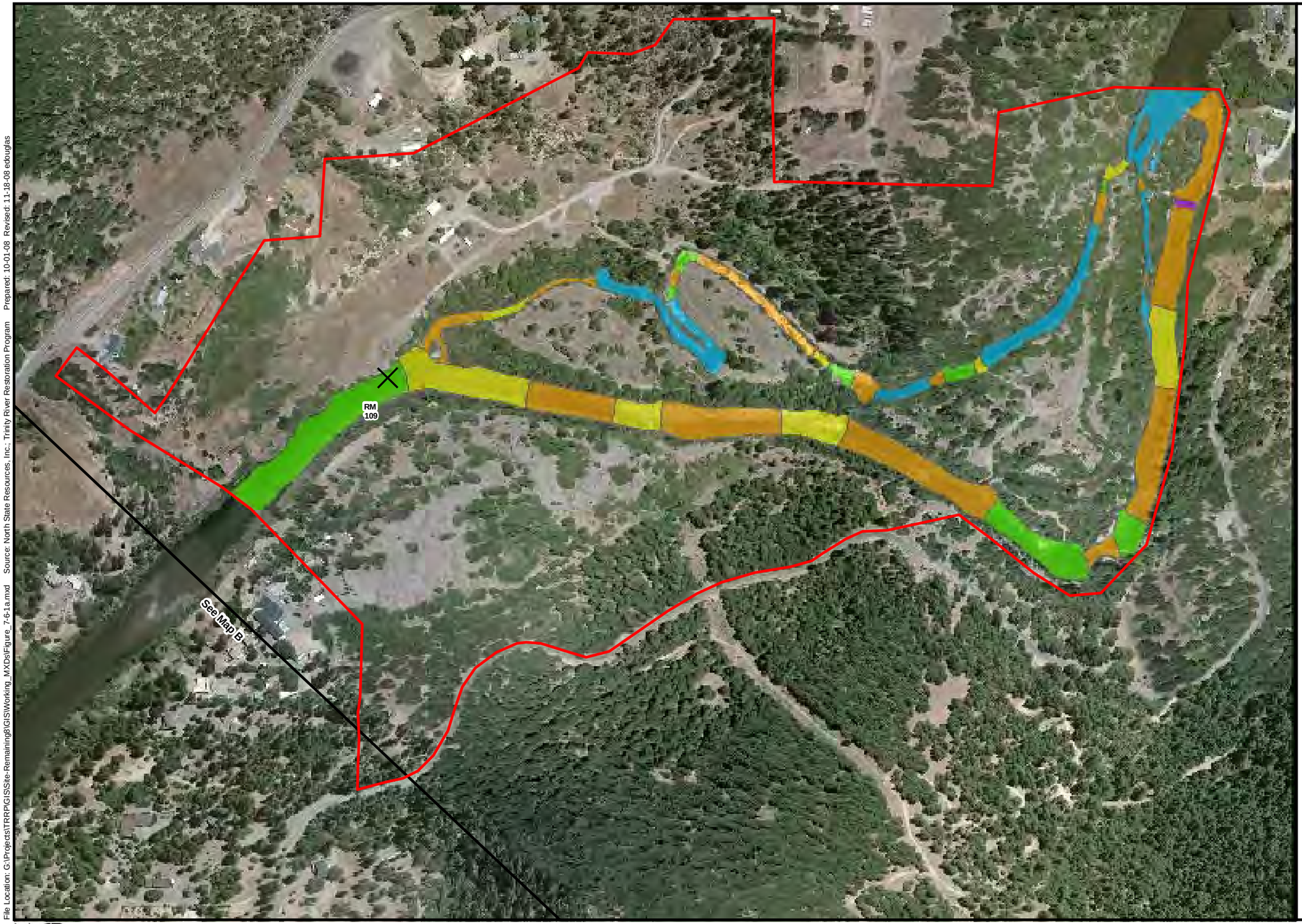
Although juvenile coho rearing habitat is considered limited in the general vicinity of the Remaining Phase 1 sites, juveniles are expected to utilize suitable habitats in the 40-mile reach of the mainstem Trinity River below Lewiston Dam year-round (Glase, pers. comm. 2002). Pool habitat associated with

boulders and large woody debris (LWD) is particularly preferred by rearing coho salmon (Hassler 1987; Sandercock 1991; Moyle 2002). In 2006, CDFG biologists snorkeled during the summer low-flow period (450 cfs) to enumerate juvenile coho salmon in the reach between Lewiston Dam and Steelbridge Day Use area. Juvenile coho salmon were predominantly found in four mesohabitat types as follows: side-channels (38.73 percent), glides (28.72 percent), backwaters (16.58 percent), and runs (10.55 percent). Juvenile coho salmon were found in close proximity to the bank (mean 2.16 feet) and to both object cover (mean 1.08 feet) and overhead cover (mean 2.16 feet). The dominant object cover type used by juvenile coho salmon was non-emergent rooted aquatic vegetation (55.74 percent of observations), while the second most used object cover type was small woody debris (26.12 percent) (Garrison 2007). In contrast, Chinook fry habitat is limited to the stream edges in the low-gradient riffles and on point bars. Additional Chinook fry rearing habitat exists at the tail outs of the pool habitats. Where available, site-specific observations of juvenile rearing habitat are provided below.

In 2003, the TRRP contracted with North State Resources, Inc. to conduct a radio-telemetry study of migration and behavioral thermoregulation of adult spring-run Chinook salmon in the upper Trinity River (Marine and Lyons 2004). The greatest numbers of over-summering radio-tagged fish were observed between Evans Bar and Dutton Creek and between Lewiston Dam and Bucktail Bridge. Fish also resided for the longest times in these reaches. These tagged fish used available run and glide habitats that were typically large (surface area) and offered depths up to 4 feet. These habitats held fish for longer periods than other portions of the study reach. Exceptionally large, deep glides in the vicinity of the confluence of Carr Creek, Indian Creek, and Rush Creek were used extensively as holding habitat for adult spring-run Chinook salmon. Holding habitat with depths greater than 3 feet, including pools with depths as great as 17 feet, was used for the longest period of time during the study.

Adult summer/fall-run steelhead migrate to, and hold in, the deeper pools, runs, and glides in the general vicinity of the Remaining Phase 1 sites between the months of April and January (Leidy and Leidy 1984; Moyle 2002). These fish are active throughout the salmon spawning season, and migrate to the upper-most river reaches and into tributaries to spawn from February through April. Winter-run steelhead migrate to spawning grounds from November through April and spawn during the same time as the summer/fall run. Suitable steelhead spawning habitat occurs in the riffles throughout the reach encompassing the Remaining Phase 1 sites. Suitable juvenile steelhead rearing habitat occurs in and adjacent to the Remaining Phase 1 sites. Fry and juvenile steelhead of both runs may be expected in the riffle and run/pool habitats year-round, especially those associated with abundant SRA and large cobble/boulder habitat, including large woody debris (Hampton 1988; Moyle 2002).

Adult Pacific lampreys migrate to the mainstem Trinity River and tributaries during the spring and early summer, although they are documented to occur in the river near Lewiston through August (Moffett and Smith 1950; Moyle 2002). Suitable lamprey spawning habitat occurs in the low-gradient riffles and in the run/pool tail outs in and adjacent to the Remaining Phase 1 sites. Based on juvenile outmigrant trapping data, larval lampreys (ammocoetes) and juveniles are expected to be abundant year-round in the upper Trinity River (Glase, pers. comm. 2002). Juveniles require areas of relatively slow currents and mud- and sand-bottomed backwaters and pools, where they burrow and filter feed on detritus and algae




Site Boundary (103.421 acres)

River Mile (RM)

Matchline

**Habitat Type**

Low Slope

Moderate Slope

Pool

Run

Step

N

1:3,600

300 0 300

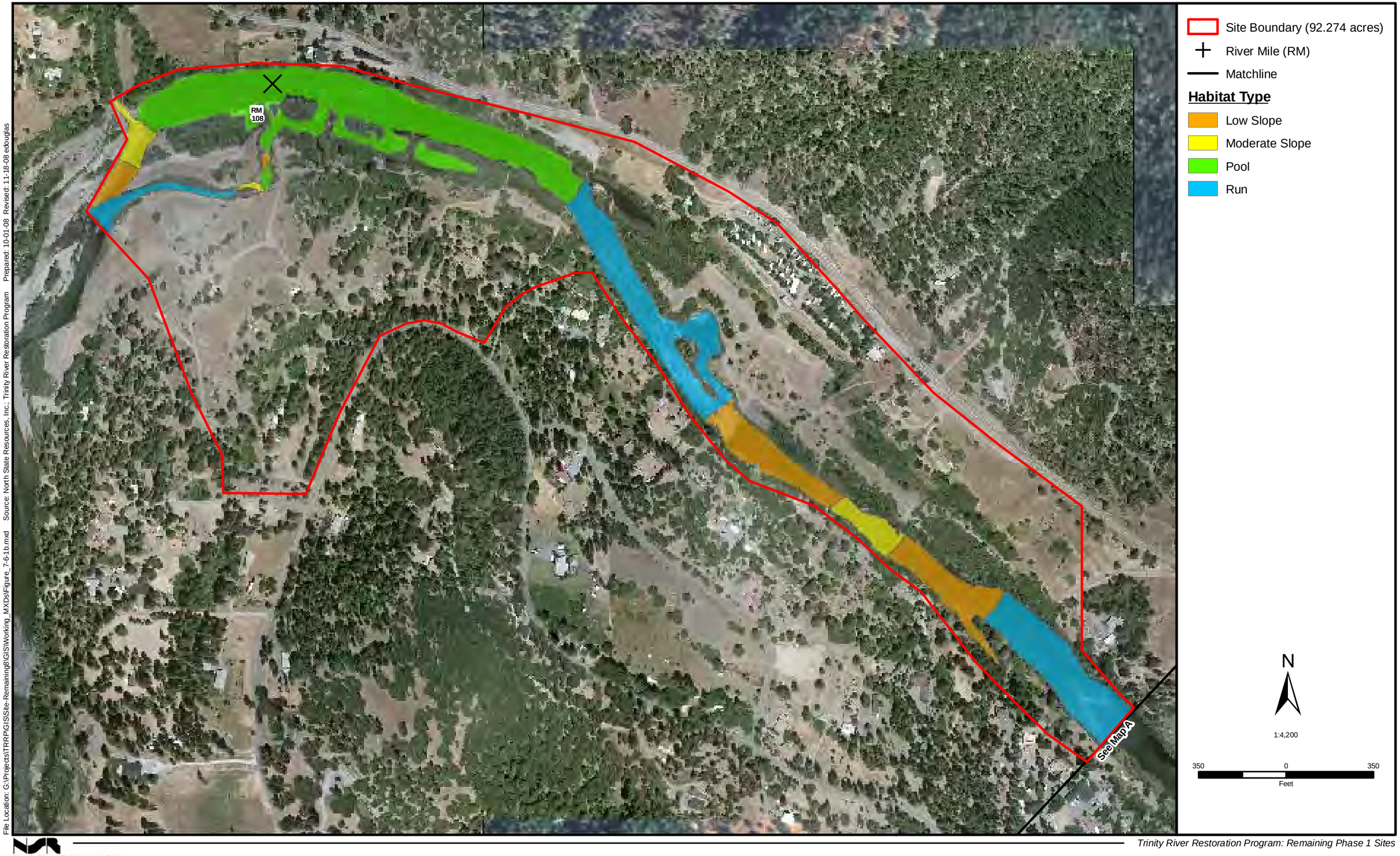
Feet

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7-6-1a.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-01-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-1a**
**Sawmill - Aquatic Habitat**




File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7-6-1b.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-01-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-1b**
**Upper Rush Creek - Aquatic Habitat**


Site Boundary (211.769 acres)

River Mile (RM)

Matchline

**Habitat Type**

Low Slope

Moderate Slope

Pool

Run

N

1:5,400

450 0 450

Feet

File Location: G:\Projects\TRRPG\SSite-Remaining8\GIS\Working_MXDs\Figure_7-6-1c.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-01-08 Revised: 11-18-08 eduglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-1c**
**Lowden Ranch - Aquatic Habitat**


Site Boundary (43.695 acres)

River Mile (RM)

Matchline

**Habitat Type**

Low Slope

Moderate Slope

Pool

Run

Step

N

1:3,000

250 0 250

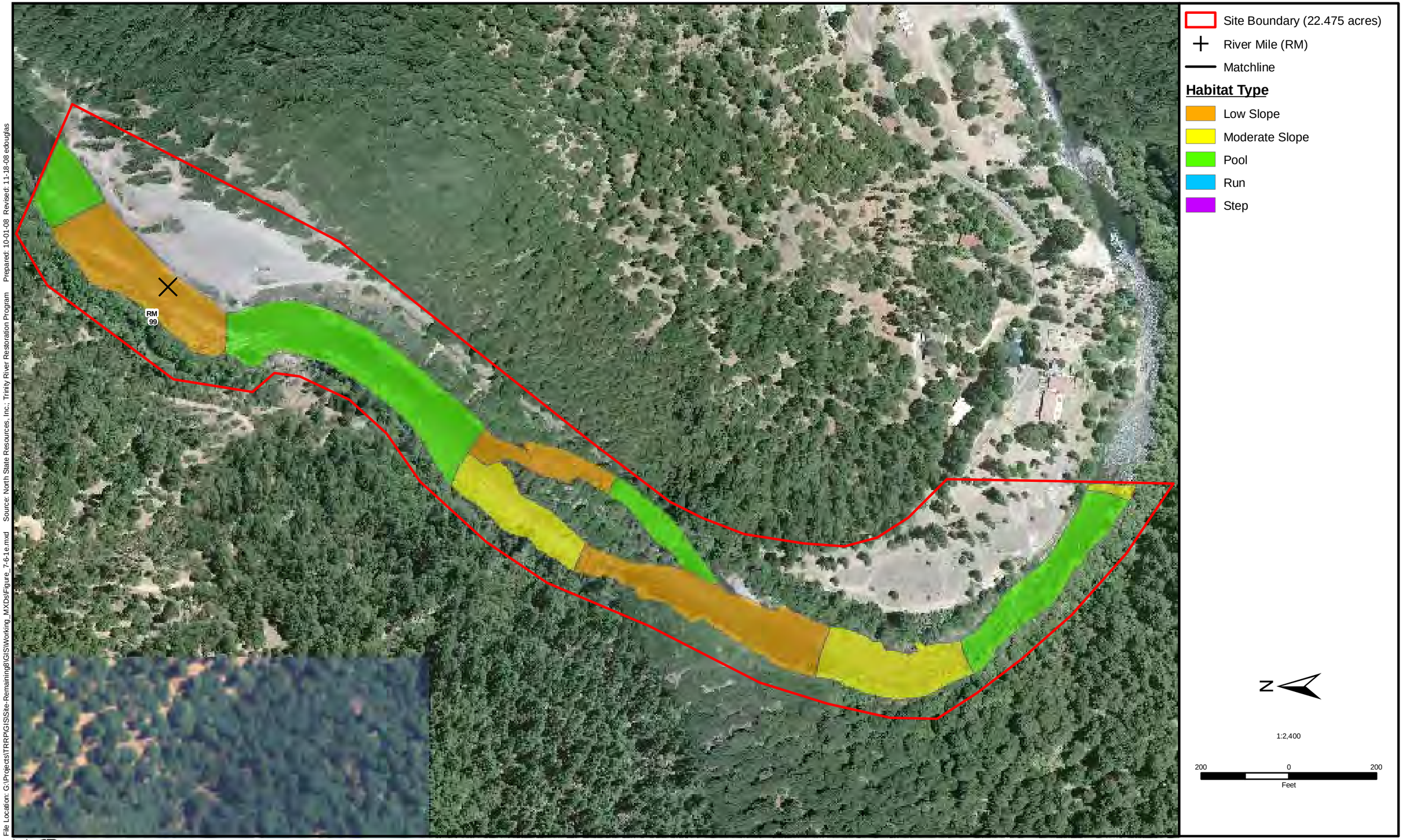
Feet

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7-6-1d.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-01-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-1d**
**Trinity House Gulch - Aquatic Habitat**

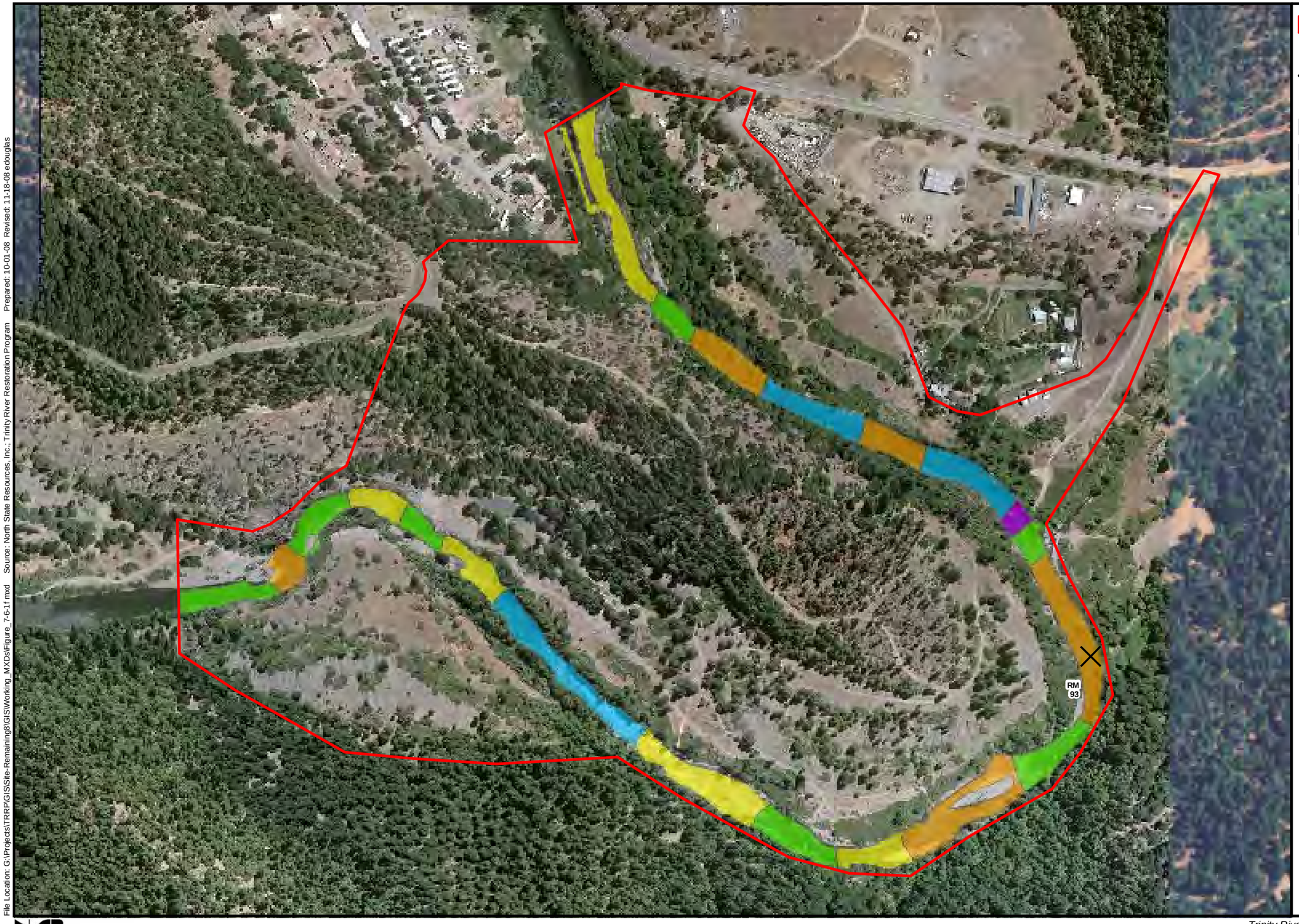



File Location: G:\Projects\TRRP\GIS\Site-Remaining\GIS\Working_MXDs\Figure_7-6-1e.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-01-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-1e**
**Steel Bridge Day Use - Aquatic Habitat**




Site Boundary (135.871 acres)

River Mile (RM)

Matchline

**Habitat Type**

Low Slope

Moderate Slope

Pool

Run

Step

N

1:4,200

350 0 350

Feet

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7-6-1f.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-01-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-1f**
**Reading Creek - Aquatic Habitat**

(Moyle 2002). Based on this habitat preference, ammocoetes may be expected in the mud and sand sediments of the pool and run/edgewater habitats in and adjacent to the Remaining Phase 1 sites.

The following site-specific aquatic habitat descriptions and species occurrence and utilization analysis have been developed from a review of annual reports, spawner distribution reports, technical studies (annual salmon redd surveys were conducted from September through mid-December 2001-2006)[1], TRRP's geomorphic characterization (see section 7.3), field visits, and TRRP's ongoing planning process.

### *Sawmill*

Salmon redd surveys encountered an annual average of 123 redds (range 98–176) within the boundary of the SM site. Because of high use of the constructed side channel and mainstem by spawning anadromous salmonids, spawning densities at this site were about double what they were for the entire redd survey reach from Old Lewiston Bridge to Bucktail River Access (132.6 vs. 64.2 redds per mile). Sixty-five percent of the redds enumerated within the SM site since 2001 were constructed upstream of the gravel injection site at RM 109.0, where there are multiple channels (main and side channels) (Chamberlain et al. 2007).

Side channel rearing habitat evaluations were conducted within the enhanced Cemetery Side Channel in 1989 and 1990 (U.S. Fish and Wildlife Service 1989, 1990). The USFWS (1990) determined that feathered banks, meanders, and cobble/boulder wing deflectors added to the Cemetery Side Channel increased habitat for Chinook salmon fry (by a factor of 5.3) and juvenile Chinook salmon (by a factor of 3.6). Studies conducted under the auspices of the TRRP in 2006 and 2007 revealed that sandy areas of this side channel were occupied by coho throughout the year, and provided larval habitat for lamprey.

Surveys focused on use of habitat by coho fry (spring, summer, and winter seasons) were conducted under the auspices of the TRRP in 2005 and 2006 in the general vicinity of this site. This survey also included observations on other species/age classes. Coho young of the year were found during the summer throughout the site, with concentrations of juvenile coho in close proximity to constructed wood clusters in the faster areas of the side channel. Winter coho fry use was only observed in the vicinity of the sharp bend in Cemetery Side Channel at the upper end of the site. Coho were observed at the entrance to the side channel and downriver on the left bank from the side channel re-entry point. Chinook and steelhead fry were observed throughout this reach (Garrison 2007).

Significant adult anadromous salmonid holding occurred in pools within the project boundary (in Cemetery Hole and in Sawmill Hole). Brown trout were also observed in these pools.

### *Upper Rush Creek*

Salmon redd surveys conducted from September through mid-December 2001 to 2006 encountered an annual average of 36 redds (range 22–52) within the boundary established for the UR site. Spawning densities in this site were lower than the entire survey reach from Old Lewiston Bridge to Bucktail River

[1] Site boundaries were revised subsequent to the salmon redd surveys.

Access (44.4 vs. 64.2 redds per mile). Spawning activity was limited to about the upper two-thirds of the site where there were suitable gravels and velocities (Chamberlain et al. 2007). Some adult Chinook and steelhead holding occurred in the pool above the Rush Creek delta, and significant numbers of brown trout were observed there.

During summer, coho salmon fry were observed along the left margin of the main river channel (Garrison 2007). High densities of coho fry were also observed in open water areas in association with dense riparian vegetation, such as the area adjacent to BLM's parking lot and river access (Garrison 2007).

### *Lowden Ranch*

Redd surveys encountered an annual average of 34 redds (range 18–51) within the boundary established for the LR site. Most of the redds were characterized as Chinook salmon redds. Spawning densities were nearly identical to what they were for the entire survey reach from Bucktail River Access to Steel Bridge River Access (34.0 redds per mile). Generally, high concentration of redds were not observed within the boundary established for this site (Chamberlain et al. 2007).

### *Trinity House Gulch*

Salmon redd surveys encountered an average of five Chinook redds (range 3–9) within the boundary established for the THG site. Spawning densities were very low compared to the entire survey reach from Bucktail River Access to Steel Bridge River Access (12.2 vs. 34.0 redds per mile) (Chamberlain et al. 2007). At the THG site, an intermittent creek enters the river along the right bank. During a June 2007 site visit, this creek went subsurface where the gulch intersected the alluvial deposits and remerged a few feet from the low-flow channel of the Trinity River. Based on casual observations, the river provides some adult salmonid holding habitat at the extreme upstream end, coincident with the mouth of Grass Valley Creek.

### *Steel Bridge Day Use*

Salmon redd surveys conducted September through mid-December 2001 to 2006 encountered an annual average of 16 redds (range 8–20) within the boundary established for the SB site. Most of these redds were Chinook. A functional side-channel along the left bank upstream of most of the activity areas supports spawning densities higher than that for the entire redd survey reach from Steel Bridge River Access to the Douglas City Campground (41.5 vs. 25.9 redds per mile). Nearly all spawning activity within this project boundary occurs on the upstream half of this side-channel, where existing channel complexity is higher (Chamberlain et al. 2007).

### *Reading Creek*

Salmon redd surveys encountered an annual average of 26 redds (range 23–28) within the boundary established for the RC site. Spawning densities at the site were slightly lower than that for the entire redd survey reach from Steel Bridge River Access to the Douglas City Campground (16.9 vs. 25.9 redds per mile). Chinook and steelhead redds were generally dispersed throughout the length of the site (Chamberlain et al. 2007).

In 2002, a stranding study was conducted at the downstream end of this site, immediately downstream of BLM's campground (Chamberlain 2003). At higher flows, stranding was observed behind the riparian berm in conjunction with a side channel feature. As flows recede, this feature is isolated from the main channel near the campground. Limited anadromous salmonid fry use surveys were conducted in 2005. Some fry were found in this area, but use appears to be limited (Trinity River Restoration Program 2007).

The RC site includes the Douglas City Campground, a site of many previous assessments, and which frequently served as a reference reach for comparison of early Reclamation restoration projects (e.g., Douglas City Feathered Edge immediately downstream) (Gallagher 1995, 1999).

### Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) and EFH are described in the Master EIR (section 4.6).

The Remaining Phase 1 sites provide all four major components of EFH as defined by the Pacific Fisheries Management Council (2000).

## 7.6.2 Environmental Consequences/Impacts and Mitigation Measures

Table 7.6-1 summarizes the potential fisheries impacts that would result from the No-Project Alternative, the Proposed Project, and Alternative 1.

**Table 7.6-1. Summary of Potential 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 7.6-1. 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 7.6-2. Implementation of the project could result in increased erosion and sedimentation that could adversely affect fishes, including the federally and state-listed coho salmon. | | | | |
| No impact | Significant | Significant | Less than significant | Less than significant |
| Impact 7.6-3. 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 |

**Table 7.6-1. Summary of Potential 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 7.6-4. 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 7.6-5. Implementation of the project would result in the permanent and temporary loss of SRA habitat for anadromous salmonids. | | | | |
| No impact | Significant | Significant | Less than significant | Less than significant |
| Impact 7.6-6. 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 7.6-1: 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.***

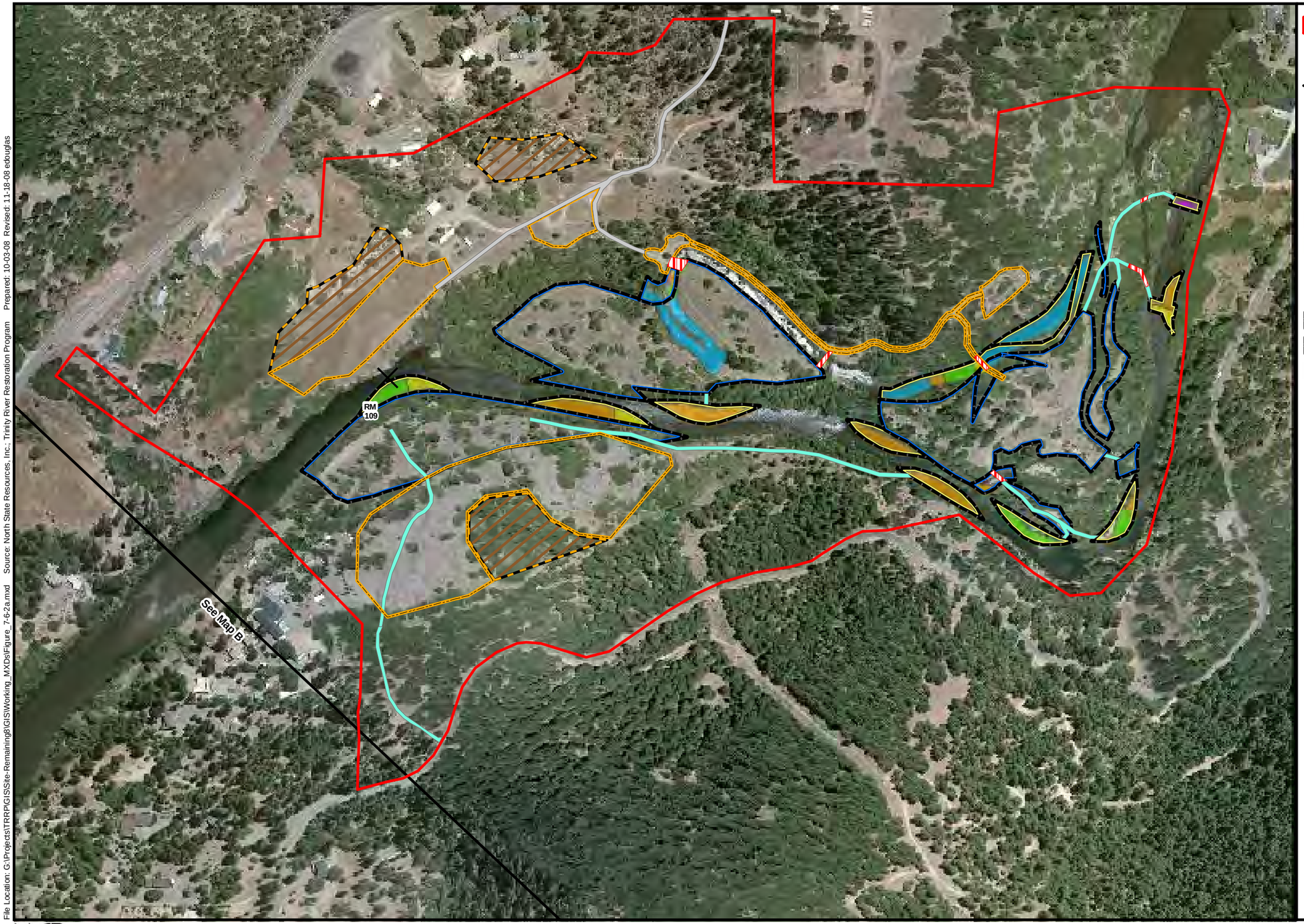
### *No-Project Alternative*

Under the No-Project Alternative, there would be no effects on spawning and rearing habitat other than those associated with current ongoing actions because the project would not be constructed. As described in Chapters 4 and 5, the TRRP and other entities have been implementing channel rehabilitation projects for several years. These projects continue to affect the Trinity River with regards to flows, sediments, channel morphology, and riparian vegetation. These affects will continue to influence the spawning and rearing habitat for anadromous fishes, irrespective of this alternative. Under this alternative, there would be no impact.

### *Proposed Project*

#### Coho Salmon

Under the Proposed Project, no permanent adverse effects to coho salmon spawning habitat within the boundaries of the Remaining Phase 1 sites would occur. Instead, the Proposed Project is expected to result in immediate as well as long-term improvements. Figures 7.6-2a-f illustrate the extent of the grading, excavating, and coarse sediment addition that would occur below the OHW in riverine habitat (blue areas) under the Proposed Project. 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




Site Boundary (103.421 acres)

River Mile (RM)

Matchline

**Construction Areas**

*Name*

Access Road - Existing

Access Road - New

Crossing

Staging Area

**Activity Areas**

*Area*

In Channel

Riverine

Upland

**Impacts to Habitat Type**

Low Slope (1.249 acres)

Moderate Slope (0.326 acre)

Pool (0.513 acre)

Run (1.067 acres)

Step (0.036 acre)

N

1:3,600

300 0 300

Feet

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7-6-2a.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-03-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-2a**
**Sawmill - Impacts of Proposed Project on Aquatic Habitat**


Site Boundary (92.274 acres)

River Mile (RM)

Matchline

**Construction Areas**

*Name*

Access Road - Existing

Access Road - New

Crossing

Staging Area

**Activity Areas**

*Area*

In Channel

Riverine

Upland

**Impacts to Habitat Type**

Low Slope (0.064 acre)

Moderate Slope (0.071 acre)

Pool (2.017 acres)

Run (0.550 acre)

N

1:4,200

350 0 350

Feet

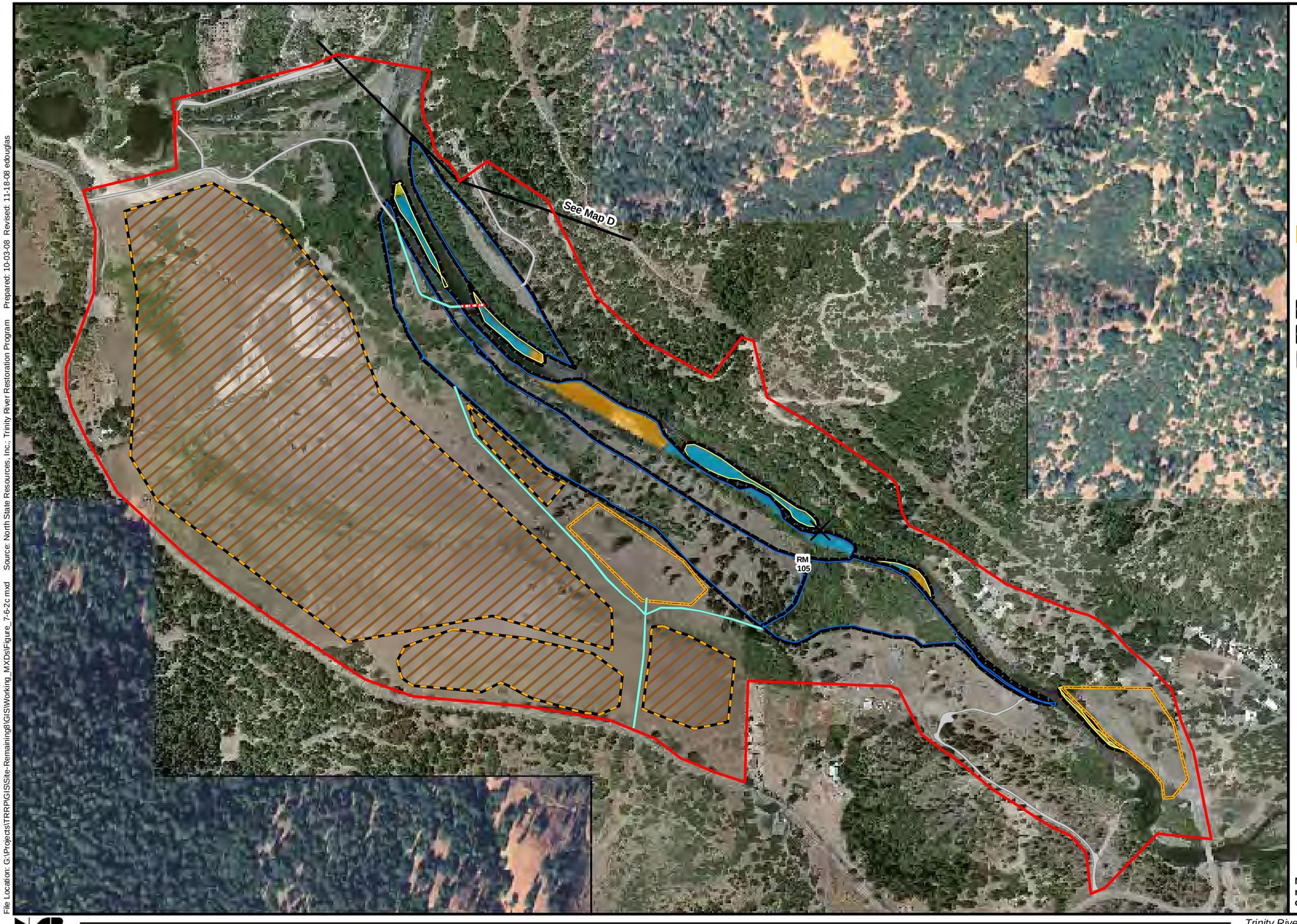
**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining\GIS\Working_MXDs\Figure_7-6-2b.mxd Prepared: 10-03-08 Revised: 11-18-08 edouglas Source: North State Resources, Inc.; Trinity River Restoration Program

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-2b**
**Upper Rush Creek - Impacts of Proposed Project on Aquatic Habitat**




Site Boundary (211.769 acres)

River Mile (RM)

Matchline

**Construction Areas**

*Name*

Access Road - Existing

Access Road - New

Crossing

Staging Area

**Activity Areas**

*Area*

In Channel

Riverine

Upland

**Impacts to Habitat Type**

Low Slope (1.876 acres)

Moderate Slope (0.225 acre)

Pool (0.001 acre)

Run (2.463 acres)

N

1:5,400

450 0 450

Feet

**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRPG\SSite-Remaining8\GIS\Working_MXDs\Figure_7-6-2c.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-03-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-2c**
**Lowden Ranch - Impacts of Proposed Project on Aquatic Habitat**


Site Boundary (43.695 acres)

River Mile (RM)

Matchline

**Construction Areas**

*Name*

Access Road - Existing

Access Road - New

Crossing

Staging Area

**Activity Areas**

*Area*

In Channel

Riverine

Upland

**Impacts to Habitat Type**

Low Slope (0.533 acre)

Pool (0.003 acre)

Run (0.013 acre)

N

1:3,000

250 0 250

Feet

**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining\GIS\Working_MXDs\Figure_7-6-2d.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-03-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-2d**
**Trinity House Gulch - Impacts of Proposed Project on Aquatic Habitat**


Site Boundary (22.475 acres)

River Mile (RM)

Matchline

**Construction Areas**

*Name*

Access Road - Existing

Access Road - New

Crossing

Staging Area

**Activity Areas**

*Area*

In Channel

Riverine

Upland

**Impacts to Habitat Type**

Low Slope (0.210 acre)

Moderate Slope (0.137 acre)

Pool (0.365 acre)

N

1:2,400

200 0 200

Feet

**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7-6-2e.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-03-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-2e**
**Steel Bridge Day Use - Impacts of Proposed Project on Aquatic Habitat**


Site Boundary (135.871 acres)

River Mile (RM)

Matchline

## Construction Areas

*Name*

Access Road - Existing

Access Road - New

Crossing

Staging Area

## Activity Areas

*Area*

In Channel

Riverine

Upland

## Impacts to Habitat Type

Low Slope (0.418 acre)

Moderate Slope (0.159 acre)

Pool (0.038 acre)

Run (0.507 acre)

Step (0.007 acre)

N

1:4,200

350 0 350

Feet

**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining\GIS\Working_MXDs\Figure_7-6-2f.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-03-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-2f**
**Reading Creek - Impacts of Proposed Project on Aquatic Habitat**

channel would result in a net increase in point bar surface area through coarse sediment deposition, increasing spawning habitat within the boundaries of the Remaining Phase 1 sites. The addition of coarse sediment, either construction or long-term injection (including spawning sized gravels) to the Trinity River at select sites would immediately provide suitable sized spawning gravels to coho and other salmonids.

Adverse effects on spawning habitat are expected to be limited to short-term, localized sedimentation caused by settling of silt disturbed by bank-side excavation activities; the removal of existing grade control structures; and the addition of coarse sediment material, including contouring and grading in the low-flow channel. Any salmon redds on or near the existing grade control structures or coarse sediment addition sites 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, excavation of grade control structures 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 (injection) of coarse sediment at various IC activity areas would 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 and mechanism would be based on the transport capacity of these flows.

Suitable habitat for juvenile salmonids occurs within the boundaries of the Remaining Phase 1 sites. Some temporary effects on the quality of this habitat will occur through removal of riparian vegetation that contributes to SRA habitat in the project reaches. Similar effects will also occur during excavation of the existing grade control structures and coarse sediment addition. The principal effects on fish include displacement of rearing salmonid fishes from their habitat and 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 further under Impact 7.6-2.

The adverse impacts on habitat are expected to be offset in the long-term by benefits associated with implementing the Proposed Project. These benefits will accrue from: 1) the constructed inundation surfaces, 2) overall reconnection of these inundated surfaces to the river at low flows, 3) potential channel migration through the alluvial surfaces, and 4) revegetation of these surfaces with native plant species that will contribute shade and large wood to the river channel. Improved connectivity, particularly during high flows is expected to increase areas of slow, shallow-water habitat preferred by salmonid fry. The process of channel migration may also create new point bars, further increasing the availability of this preferred habitat. The channel migration process and engineered side channel and alcove habitats will collectively increase the relative abundance of rearing habitat, compared to the existing condition. The

Proposed Project will include construction of 14.6 acres of side-channel, 54.3 acres of berm removal and constructed floodplain, and the addition of 58,770 cubic yards of coarse sediment, which together will enhance aquatic habitat within the boundaries of the Remaining Phase 1 sites.

Ultimately, the collective changes in channel morphology as a result of the Proposed Project will improve rearing habitat diversity for all anadromous salmonids. LWD will be strategically placed in restored side-channels and floodplain areas. The addition of LWD will provide complex physical habitat that will have important effects on juvenile and adult fish in the Trinity River in that they will 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; Cederholm et al. 1997; as cited in Cederholm et al. 1997). Although the impacts to coho salmon under the Proposed Project would be temporary and localized, they would be significant.

### Chinook Salmon

Potential impacts and benefits to Chinook would be generally similar to those previously described for coho salmon. Spring- and fall-run salmon are known to spawn and rear within the boundaries of the Remaining Phase 1 sites. Juvenile spring-run Chinook salmon would be expected to rear year-round within these sites and may be displaced by in-river work activities. Additionally, prior to spawning adult spring-run Chinook salmon utilize holding habitat offered by run, glide, and pool areas within these sites. No permanent adverse impacts to spring-run Chinook salmon holding habitat will occur. The Proposed Project does not include activities that will directly fill, modify, or otherwise affect the quality or quantity of spring-run holding habitat in the Trinity River. Temporary effects on spring-run Chinook holding habitat associated with construction of the Proposed Project would be limited to short-term, localized increases in transient turbidity caused by bank-side excavation activities; the removal of existing grade control structures; and the addition of coarse sediment material, including contouring and grading in the low flow channel. The potential effects of increased suspended sediment and turbidity to holding adult spring-run Chinook salmon are addressed under Impact 7.5-2.

### Steelhead

Potential impacts and benefits to steelhead resulting from implementation of the Proposed Project would be generally similar to those previously described for coho and Chinook salmon. Summer, fall, and winter runs of steelhead are known to migrate and stage within the boundaries established for the Remaining Phase 1 sites and may spawn (as adults) and rear (as juveniles).

### Pacific Lamprey

Potential impacts and benefits to Pacific lamprey resulting from implementation of the Proposed Project 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. The removal of riparian vegetation that contributes to SRA habitat within the site boundaries could also 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 the Riparian Revegetation and Monitoring Plan, described in Chapter 2, will alleviate this impact over the longer term.

Although the impacts to coho salmon and other anadromous fish under the Proposed Project would be temporary and localized, they would be significant.

### *Alternative 1*

#### Coho Salmon

Under Alternative 1, rehabilitation activities at the Remaining Phase 1 sites would be similar to, but less than, those described for the Proposed Project. Figures 7.6-3a-f illustrate the locations and types of activities included in Alternative 1. Alternative 1 would result in a reduction in the temporary and permanent construction-related impacts to riverine habitats below the OHW (blue areas) compared to the Proposed Project. Specifically, this alternative reduces the number of riverine, upland, and in-channel activities, including stream crossings at five of the sites. The activities proposed at the SM site are identical to those included in the Proposed Project. Alternative 1 includes coarse sediment injection activities at select sites. Similar to the Proposed Project, these locations would be used to stockpile and inject gravel for mobilization at high flows. Introduction of the gravel would take place during spring for distribution by the river during high flows, or delivered to the mid-channel during high flows using mechanized equipment. Alternative 1 will include construction of 14.6 acres of side-channel, 48.8 acres of berm removal and constructed floodplain, and the addition of 53,215 cubic yards of coarse sediment, which will contribute to the quantity and quality of aquatic habitat in this reach of the Trinity River.

Most of the expected benefits of the Proposed Project would also occur under this alternative. Although Alternative 1 would provide benefits to coho salmon, the temporary and localized impacts to spawning and rearing habitat remain significant.

#### Chinook Salmon

Alternative 1 would result in temporary and permanent construction-related impacts to spawning, holding, and rearing habitat for Chinook salmon generally similar to those described for coho salmon. However, the reduction in the number, type, and magnitude of activities included in Alternative 1 would reduce these impacts relative to the Proposed Project. Most of the expected benefits of the Proposed Project would occur under this alternative.

#### Steelhead

Alternative 1 would result in temporary and permanent construction-related impacts to spawning and rearing habitat for steelhead generally similar to those described for coho salmon. However, the reduction in the number, type, and magnitude of activities included in Alternative 1 would reduce these impacts relative to the Proposed Project. Most of the expected benefits of the Proposed Project would occur under this alternative.

#### Pacific Lamprey

Alternative 1 would result in temporary and permanent construction-related impacts to spawning and rearing habitat for Pacific lampreys similar to those described for coho salmon. However, the reduction in the number, type, and magnitude of activities included in Alternative 1 would reduce these impacts relative to the Proposed Project. Most of the expected benefits of the Proposed Project would occur under this alternative.

Although the impacts to coho salmon and other anadromous fish under Alternative 1 would be temporary and localized, they would be significant.

## Mitigation Measures

### *No-Project Alternative*

No significant impacts were identified; therefore, no mitigation is required.

## Significance after Mitigation

Not applicable

### *Proposed Project and Alternative 1*

Mitigation measures detailed under Impact 4.6-1 in the Master EIR apply (section 4.6.2). No additional mitigation measures are required.

## Significance after Mitigation

Less than significant

**Impact 7.6-2: 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.***

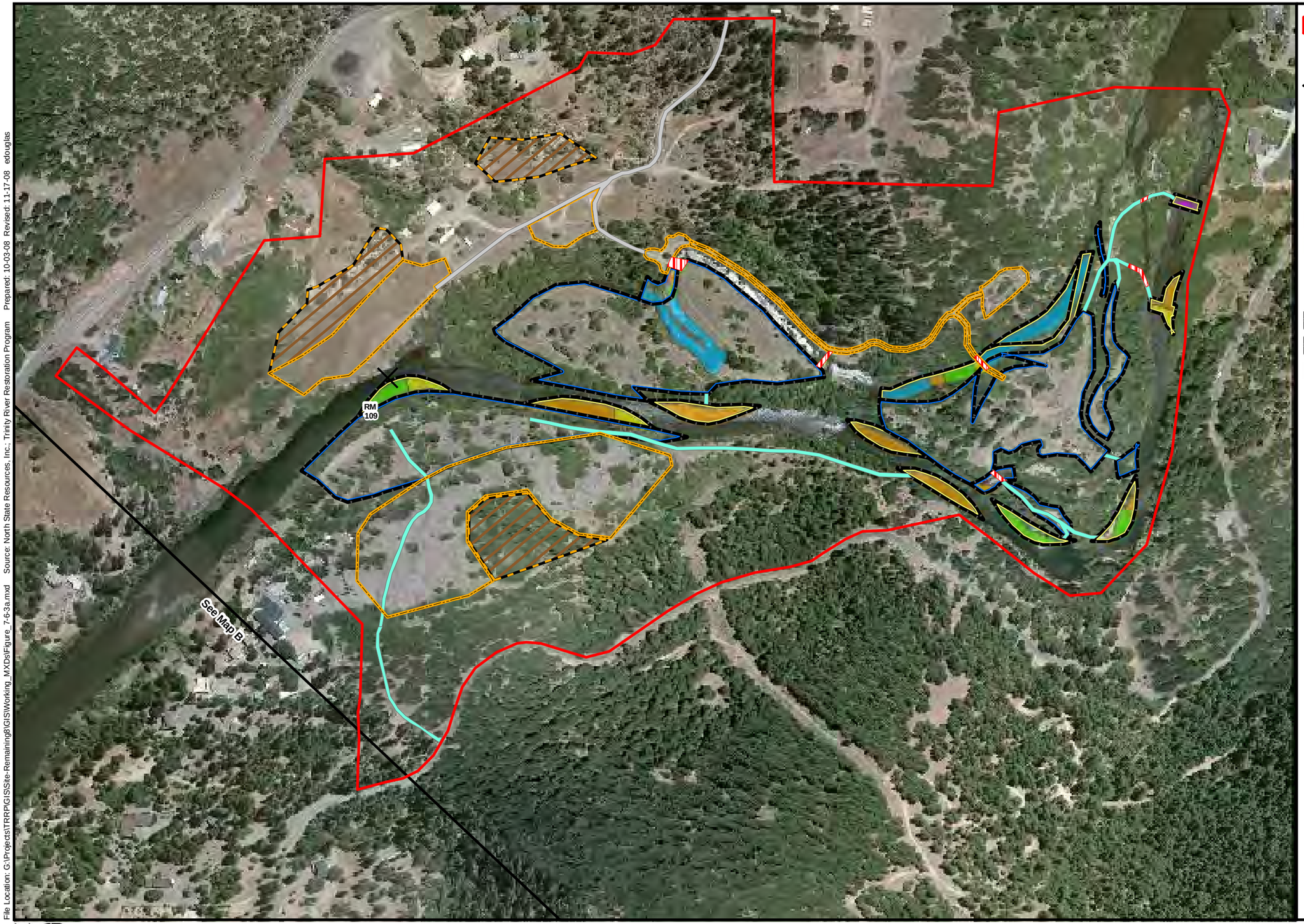
### *No-Project Alternative*

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. Similar to previous discussions, this alternative acknowledges that a number of restoration activities that are intended to restore the fishery resources and functional values offered by the mainstem Trinity River have been implemented or are ongoing. While some of these activities may result in changes to erosional processes and sedimentation levels, these changes are taken into account in the evaluation of this alternative. The No-Project Alternative would not result in an impact with respect to this issue.

### *Proposed Project*

#### Coho Salmon

Activities related to implementation of the Proposed Project would result in the 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 project sites and increase the potential for sediment delivery to the Trinity River. The turbidity of a water body is related to the concentration of suspended solids. Suspended solids and turbidity generally do not acutely affect aquatic organisms unless they reach extremely high levels (i.e., levels of suspended solids reaching 25 mg/L). At these high levels, suspended solids can adversely affect the physiology and behavior of aquatic organisms and may suppress




Site Boundary (103.421 acres)

River Mile (RM)

Matchline

**Construction Areas**

*Name*

Access Road - Existing

Access Road - New

Crossing

Staging Area

**Activity Areas**

*Area*

In Channel

Riverine

Upland

**Impacts to Habitat Type**

Low Slope (1.249 acres)

Moderate Slope (0.326 acre)

Pool (0.513 acre)

Run (1.067 acres)

Step (0.036 acre)

N

1:3,600

300 0 300

Feet

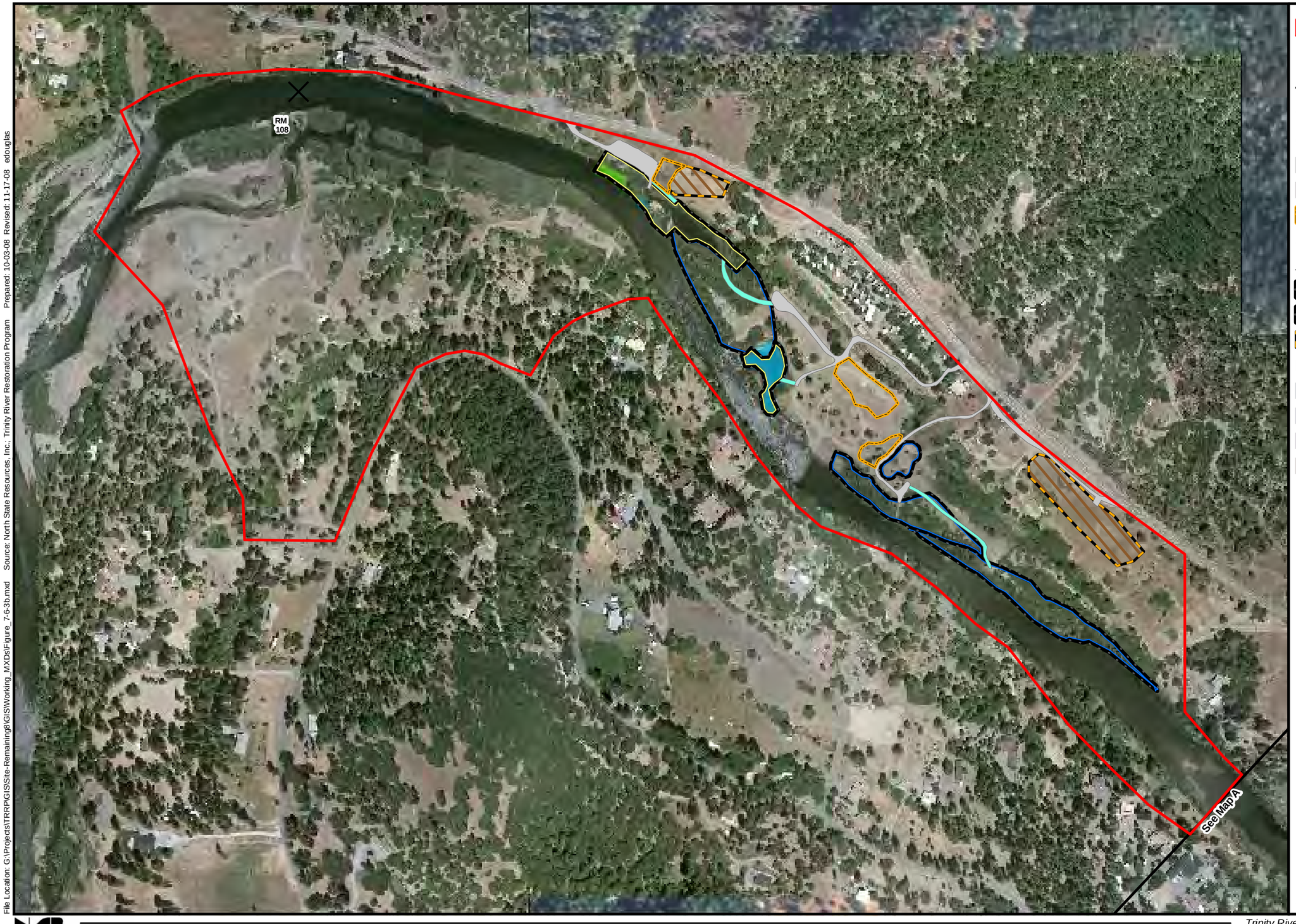
**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining\GIS\Working_MXDs\Figure_7-6-3a.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-03-08 Revised: 11-17-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-3a**
**Sawmill - Impacts of Alternative 1 on Aquatic Habitat**




Site Boundary (92.274 acres)

River Mile (RM)

Matchline

**Construction Areas**

*Name*

Access Road - Existing

Access Road - New

Staging Area

**Activity Areas**

*Area*

In Channel

Riverine

Upland

**Impacts to Habitat Type**

Low Slope (0.008 acre)

Moderate Slope (0.003 acre)

Pool (0.121 acre)

Run (0.514 acres)

N

1:4,200

350 0 350

Feet

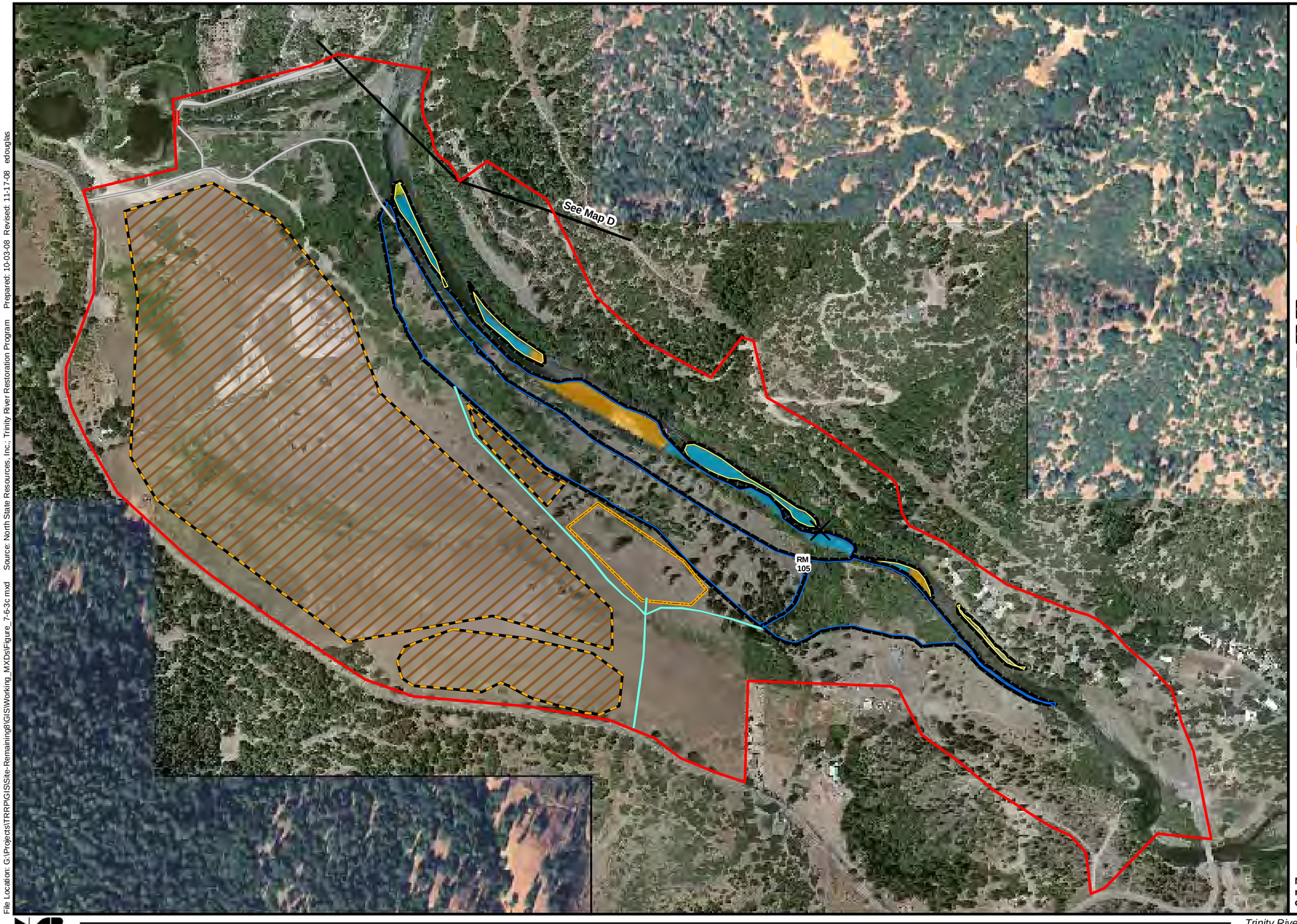
**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7-6-3b.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-03-08 Revised: 11-17-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-3b**
**Upper Rush Creek - Impacts of Alternative 1 on Aquatic Habitat**




Site Boundary (211.769 acres)

River Mile (RM)

Matchline

**Construction Areas**

*Name*

Access Road - Existing

Access Road - New

Crossing

Staging Area

**Activity Areas**

*Area*

In Channel

Riverine

Upland

**Impacts to Habitat Type**

Low Slope (1.624 acres)

Moderate Slope (0.097 acre)

Run (2.443 acres)

N

1:5,400

450 0 450

Feet

**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining\GIS\Working_MXDs\Figure_7-6-3c.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-03-08 Revised: 11-17-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-3c**
**Lowden Ranch - Impacts of Alternative 1 on Aquatic Habitat**


Site Boundary (43.695 acres)

River Mile (RM)

Matchline

**Construction Areas**

*Name*

Access Road - Existing

Access Road - New

Crossing

**Activity Areas**

*Area*

In Channel

Riverine

Upland

**Impacts to Habitat Type**

Low Slope (0.533 acre)

Pool (0.003 acre)

Run (0.013 acre)

N

1:3,000

250 0 250

Feet

**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7-6-3d.mxd Prepared: 10-03-08 Revised: 11-17-08 edouglas

Source: North State Resources, Inc.; Trinity River Restoration Program

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-3d**
**Trinity House Gulch - Impacts of Alternative 1 on Aquatic Habitat**


Site Boundary (22.475 acres)

River Mile (RM)

Matchline

**Construction Areas**

*Name*

Access Road - New

Staging Area

**Activity Areas**

*Area*

In Channel

Riverine

Upland

**Impacts to Habitat Type**

Low Slope (0.210 acre)

Moderate Slope (0.137 acre)

Pool (0.146 acre)

N

1:2,400

200 0 200

Feet

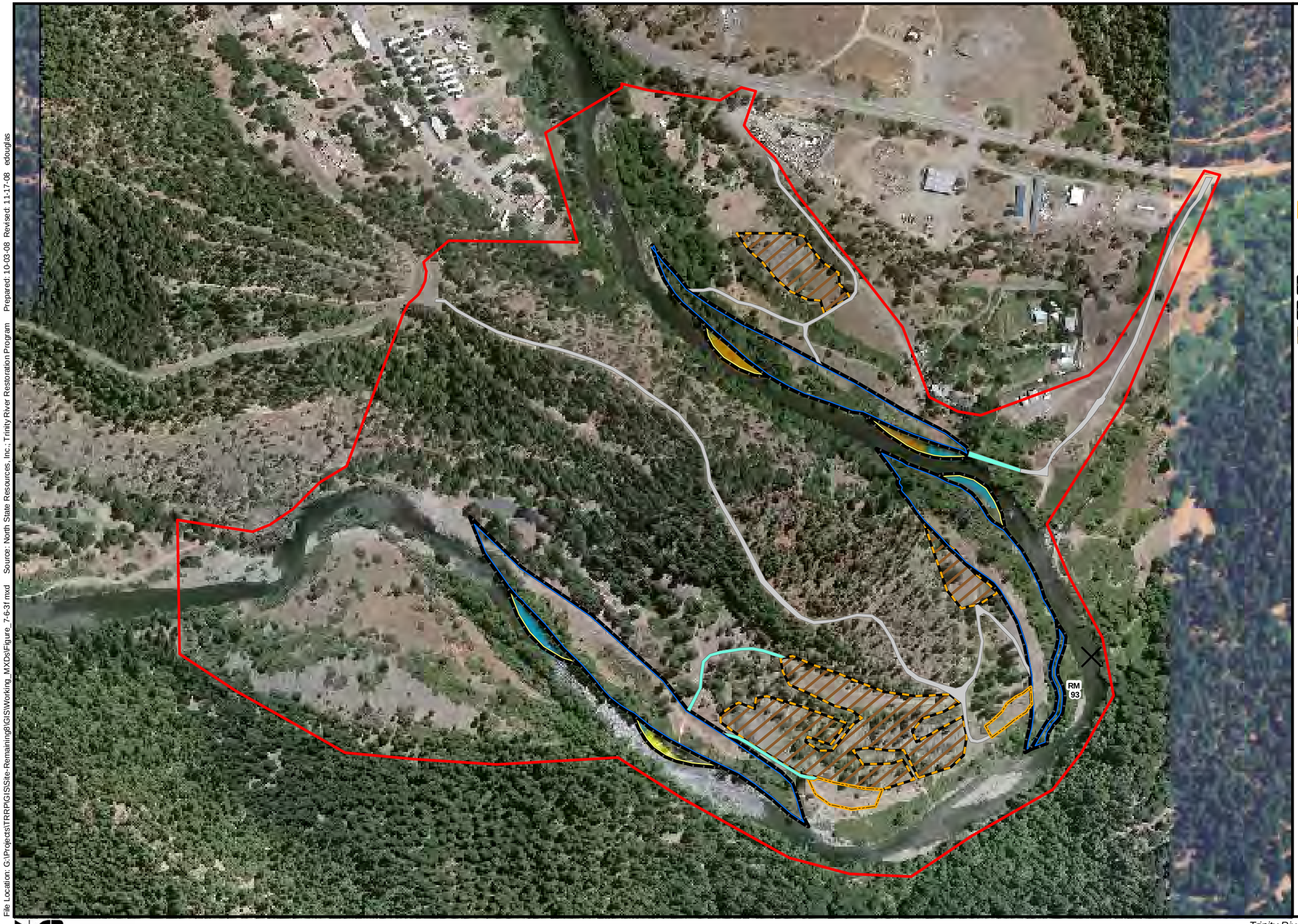
**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7-6-3e.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-03-08 Revised: 11-17-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-3e**
**Steel Bridge Day Use - Impacts of Alternative 1 on Aquatic Habitat**




Site Boundary (135.871 acres)

River Mile (RM)

Matchline

**Construction Areas**

*Name*

Access Road - Existing

Access Road - New

Staging Area

**Activity Areas**

*Area*

In Channel

Riverine

Upland

**Impacts to Habitat Type**

Low Slope (0.418 acre)

Moderate Slope (0.124 acre)

Pool (0.002 acre)

Run (0.496 acre)

Step (0.007 acre)

N

1:4,200

350 0 350

Feet

**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7-6-3f.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-03-08 Revised: 11-17-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-3f**
**Reading Creek - Impacts of Alternative 1 on Aquatic Habitat**

photosynthetic activity at the base of food webs, affecting aquatic organisms either directly or indirectly (Alabaster and Lloyd 1980).

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-river excavation is planned as part of the Proposed Project; therefore, it is expected that excavation and operation of heavy equipment would resuspend silt and sand, which would result in localized and temporary increases of suspended sediment and turbidity.

Approximately 12.8 acres of mainstem Trinity River main channel habitat would be temporarily affected during the various in-channel activities. Low gradient (4.4 acres) and pool habitat (2.9 acres) would be impacted more than other available habitat types. In-channel activities would result in 9.8 acres of temporary impacts to mainstem Trinity River habitat. Operation of heavy equipment in the active channel during these activities would likely resuspend streambed sediments but are not likely to add silt material 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 gravel placement or vehicle crossings 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. Excavation, grading, and coarse sediment addition within the channel would occur only 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 the area 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 to competitive interactions or predation for juvenile coho salmon (Berg and Northcote 1985). These temporary impacts were anticipated and addressed in the 2000 Biological Opinion and associated incidental take statement for the ROD and amended Biological Opinion for in-river work.

## Chinook Salmon

Potential impacts to Chinook salmon populations in the Trinity River resulting from implementation of the Proposed Project 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 within and adjacent to the Remaining Phase 1 sites. Construction activities are proposed during the spawning period, and in-river construction may temporarily 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. Juvenile spring-run Chinook salmon

are expected to rear throughout the year within the site boundaries, 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 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. Summer and winter runs of Klamath Mountain Province ESU steelhead are known to migrate, stage (as adults), and rear (as juveniles) within the site boundaries throughout the proposed construction season. Both runs generally spawn during the winter.

### Pacific Lamprey

Potential 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 salmon and other anadromous salmonids. Adult Pacific lampreys migrate upstream from spring through early summer and again in the fall to spawn. Larval lampreys inhabit the river year-round. Siltation of nests that may be built in suitable habitats (i.e., low-gradient riffles) could occur. Filter feeding by larval lampreys could be disrupted by an increase in suspended sediments caused by construction-related erosion, although this impact would be very localized and temporary.

While the Proposed Project would increase aquatic habitat within the boundaries of the Remaining Phase 1 sites, the proposed construction activities would result in an increase in erosion and sedimentation in the short-term. While the long-term impact would be beneficial, the short-term impacts on fishes within the Trinity River would be significant.

#### *Alternative 1*

### Coho Salmon

Alternative 1 would result in temporary effects on coho salmon from erosion, sedimentation, and turbidity that are generally similar to, but less than, those described for the Proposed Project. As illustrated in Figures 7.6-3a-f, the location, type, and magnitude of activities included within this alternative would be reduced, with the exception of the SM site. Most of the expected benefits of the Proposed Project would also occur under this alternative. Approximately 10.1 acres of mainstem Trinity River main channel habitat would be temporarily affected during the various in-channel activities. Low gradient (4.0 acres) and run habitat (4.5 acres) would be impacted more than other available habitat types. In-channel activities would result in a temporary impact to 8.8 acres of mainstem Trinity River habitat. However, construction activities would result in an increase in the amount of project generated erosion, sedimentation, and turbidity.

### Chinook Salmon

Alternative 1 would result in erosion, sedimentation, and turbidity impacts to Chinook salmon similar to those previously described for coho salmon.

### Steelhead

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

### Pacific Lamprey

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

While Alternative 1 would increase aquatic habitat within the boundaries of the Remaining Phase 1 sites, the proposed construction activities would result in an increase in erosion and sedimentation in the short-term. While the long-term impact would be beneficial, the short-term impacts on fishes within the Trinity River would be significant.

## 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*

Mitigation measures detailed under Impact 4.6-2 in the Master EIR apply (section 4.6.2). No additional mitigation measures are required.

## Significance after Mitigation

Less than significant/beneficial

**Impact 7.6-3: Construction activities associated with the project could 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*

#### Coho Salmon

Construction activities typically include the refueling of construction equipment on location. The Proposed Project also includes activities that would place mechanized equipment (e.g., trucks, excavators) within the active channel for short periods. As a result, minor fuel and oil spills could occur and there would be a risk of larger releases. Without rapid containment and clean up, these materials could be toxic, depending on the location of the spill in proximity to surface water features, including the Trinity River. Oils, fuels, and other contaminants could have deleterious effects on all salmonid life stages within close proximity to construction activities.

#### Chinook Salmon

Potential impacts to 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.

#### Steelhead

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

#### Pacific Lamprey

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

Although short-term, these impacts are considered significant.

### *Alternative 1*

The risk of, and impacts resulting from, construction-related accidental spills of hazardous materials associated with Alternative 1 would be similar to those associated with the Proposed Project for all anadromous fish species. These impacts would be significant.

## Mitigation Measures

### *No-Project Alternative*

No significant impacts were identified; therefore, no mitigation is required.

## Significance after Mitigation

Not applicable

### *Proposed Project and Alternative 1*

Mitigation measures detailed under Impact 4.6-3 in the Master EIR apply (section 4.6.2). No additional mitigation measures are required.

## Significance after Mitigation

Less than significant

**Impact 7.6-4: 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 all the Remaining Phase 1 sites, and juvenile coho salmon may be expected to rear within these boundaries year-round. Adult coho migrate through these sites and use suitable spawning habitat throughout the 40-mile reach of the Trinity River below Lewiston Dam. Direct injury to, or mortality of, coho salmon could occur during in-river construction activities, including excavation of existing grade control structures, coarse sediment addition including grading, and use of river crossings at any of the six sites included in the Proposed Project. Excavation of the existing grade control structures, coarse sediment addition, and associated grading would be conducted only during late-summer low-flow conditions (e.g., July 15 – September 15). Thus, minimizing the potential for direct mortality to rearing coho, because 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 upstream or downstream of the project, because juvenile rearing habitat within 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 eggs/alevins would not occur. However, direct impacts to juvenile coho salmon could occur during the annual, long-term addition of coarse sediment at stream-side injection sites during spring flow events. Coarse sediment would be injected by positioning the material bankside for distribution by the river at high flows, or by delivering the material to the mid-channel via mechanized equipment. This could result in injury to, or mortality of, juvenile coho salmon if they are present, which would be a significant impact.

A small, temporary, but uncertain level of stranding of coho salmon fry could occur on the newly constructed inundation surfaces and side channels during rapidly receding flood-flow periods in 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 designs for constructed inundation surfaces incorporate a downstream slope equal to that of the river channel and 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 through these 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 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 within and directly adjacent to the river channel could disturb holding spring-run Chinook salmon. The principal effect to spring-run Chinook is that they would be forced to relocate. The Proposed Project would not impair migration, and spring-run Chinook salmon 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 that encompasses the Phase 1 and Phase 2 sites, 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 spring run can accumulate stresses. Based on the proximity of the site boundaries 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 spring-run Chinook salmon are able to deal with stressors (e.g., relocation) without adverse effect (North State Resources 2005).

### Steelhead

Potential impacts to 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 coho salmon and other anadromous salmonids.

While the activities included in the Proposed Project are intended to benefit salmonids and other aquatic organisms, the short-term construction impacts would be significant.

#### *Alternative 1*

Construction-related mortality of adult and juvenile fishes associated with Alternative 1 would be generally less than that of the Proposed Project due to the reduction in the location, number, and magnitude of activities. While the activities included in Alternative 1 are intended to benefit salmonids and other aquatic organisms, the short-term construction impacts would be significant.

## Mitigation Measures

### *No-Project Alternative*

No significant impacts were identified; therefore, no mitigation is required.

## Significance after Mitigation

Not applicable

### *Proposed Project and Alternative 1*

Mitigation measures detailed under Impact 4.6-4 in the Master EIR apply (section 4.6.2). No additional mitigation measures are required.

## Significance after Mitigation

Less than significant

**Impact 7.6-5: Implementation of the project would result in the permanent and temporary loss of SRA 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, loss of SRA habitat would not occur because the project would not be constructed. Therefore, there would be no impact.

### *Proposed Project*

As described in section 4.6, Fishery Resources, the term *riparian habitat* encompasses the range of riparian vegetation conditions within the boundaries of the Phase 1 and Phase 2 sites. It does not have a specific legal description or definition. To illustrate the impacts to SRA habitat, a set of figures (Figures 7.6-4a-f) is provided following this impact discussion.

Removal of montane riparian wetland vegetation along the banks of the Trinity River could adversely affect the quality of SRA habitats used by rearing salmonids. 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 large woody debris 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 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 over the long-term under the Proposed Project.

Removal of the riparian berm and re-activation of adjacent floodplains within riverine activity areas would allow for natural revegetation of most of the riparian habitat (mixture of willows, alders, and cottonwoods) that would be lost as a result of berm removal and floodplain contouring. Under the Proposed Project, large seed trees (willow and cottonwood) and large nesting trees would be left intact.

Additionally, riparian habitat removed under the Proposed Project would be replaced during the revegetation efforts consistent with the requirements of the Riparian Revegetation and Monitoring Plan. While no permanent net loss of SRA features would necessarily occur, the short-term impact of removing 60.5 acres of riparian vegetation is considered a significant impact.

#### *Alternative 1*

The impacts associated with Alternative 1 are illustrated in Figures 7.6-5a-f. Similar to other impact discussions, this alternative represents a reduction in the location, type, and magnitude of activities, relative to the Proposed Project. These reductions will decrease the total amount of SRA habitat that will be impacted in the short-term. While no permanent net loss of SRA features would necessarily occur, the short-term impact of removing 52.0 acres of riparian vegetation is considered significant.

### Mitigation Measures

#### *No-Project Alternative*

No significant impacts were identified; therefore, no mitigation is required.

### Significance after Mitigation

Not applicable

#### *Proposed Project and Alternative 1*

Mitigation measures detailed under Impact 4.6-5 in the Master EIR apply (section 4.6.2). No additional mitigation measures are required.

### Significance after Mitigation

Less than significant

**Impact 7.6-6: 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.***

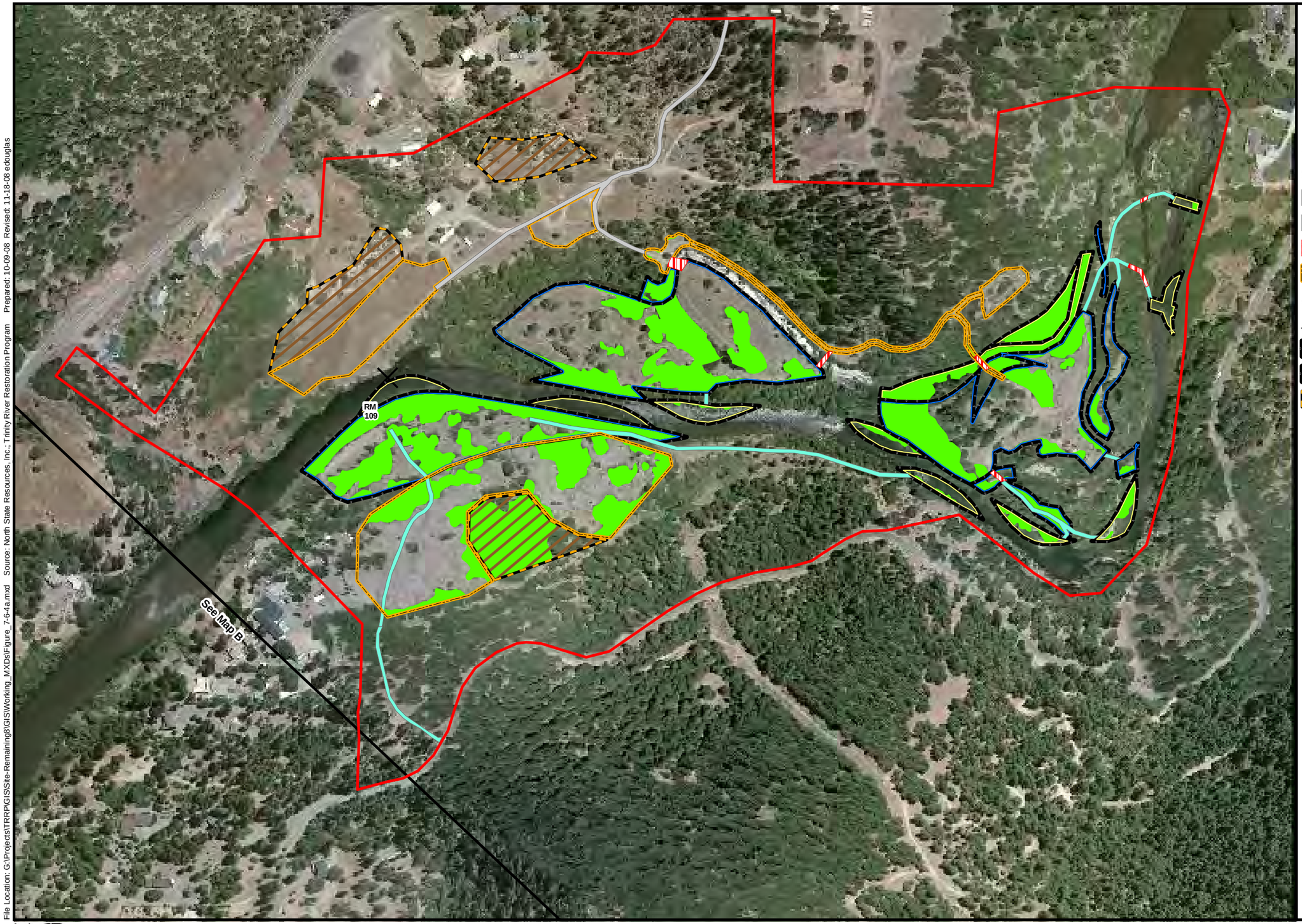
#### *No-Project Alternative*

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 would require temporary placement of low-flow channel crossings at each of the Remaining Phase 1 sites, using alluvial materials as specified in Chapter 2. 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. Construction activities could require




Site Boundary (103.421 acres)

River Mile (RM)

Matchline

Riparian Area Habitat Impacts (11.478 acres)

**Construction Areas**

*Name*

Access Road - Existing

Access Road - New

Crossing

Staging Area

**Activity Areas**

*Area*

In Channel

Riverine

Upland

N

1:3,600

300 0 300

Feet

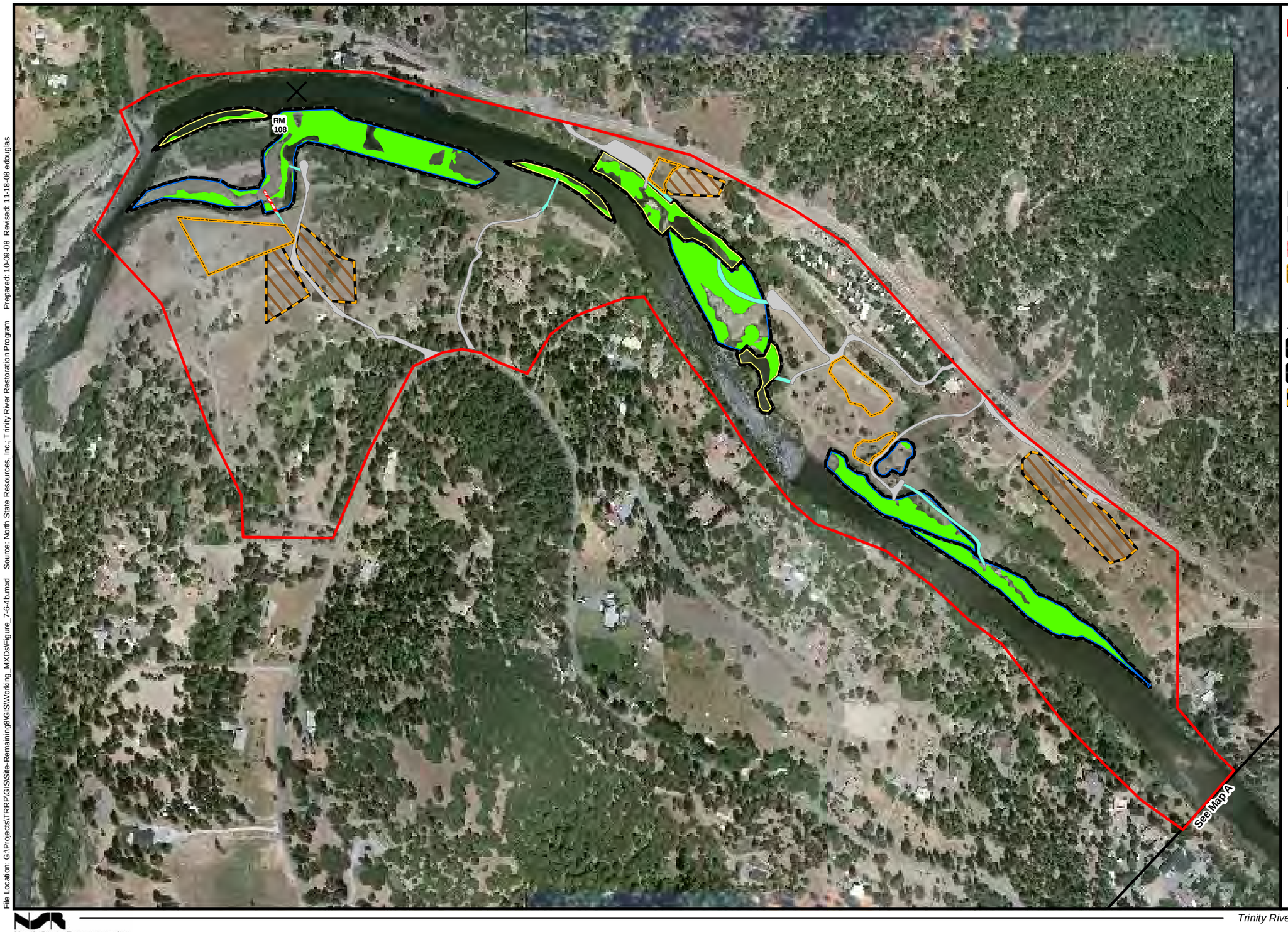
**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7-6-4a.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-09-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-4a**
**Sawmill - Impacts of Proposed Project on Riparian Area Habitat**




Site Boundary (92.27 acres)

River Mile (RM)

Matchline

Riparian Area Habitat Impacts (6.899 acres)

**Construction Areas**

*Name*

Access Road - Existing

Access Road - New

Crossing

Staging Area

**Activity Areas**

*Area*

In Channel

Riverine

Upland

N

1:4,200

350 0 350

Feet

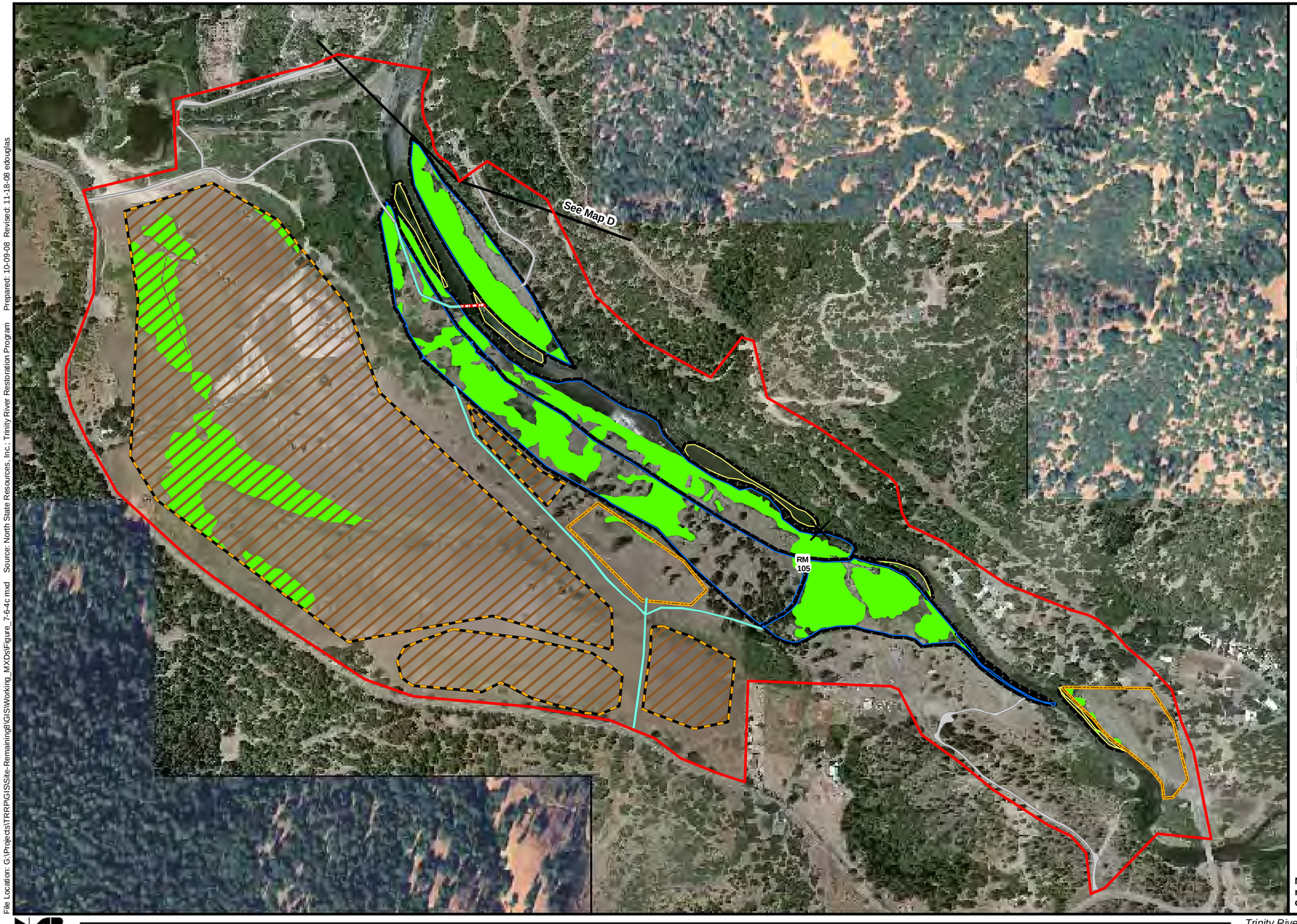
**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7-6-4b.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-09-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-4b**
**Upper Rush Creek - Impacts of Proposed Project on Riparian Area Habitat**




Site Boundary (211.774 acres)

River Mile (RM)

Matchline

Riparian Area Habitat Impacts (25.979 acres)

**Construction Areas**

*Name*

Access Road - Existing

Access Road - New

Crossing

Staging Area

**Activity Areas**

*Area*

In Channel

Riverine

Upland

N

1:5,400

450 0 450

Feet

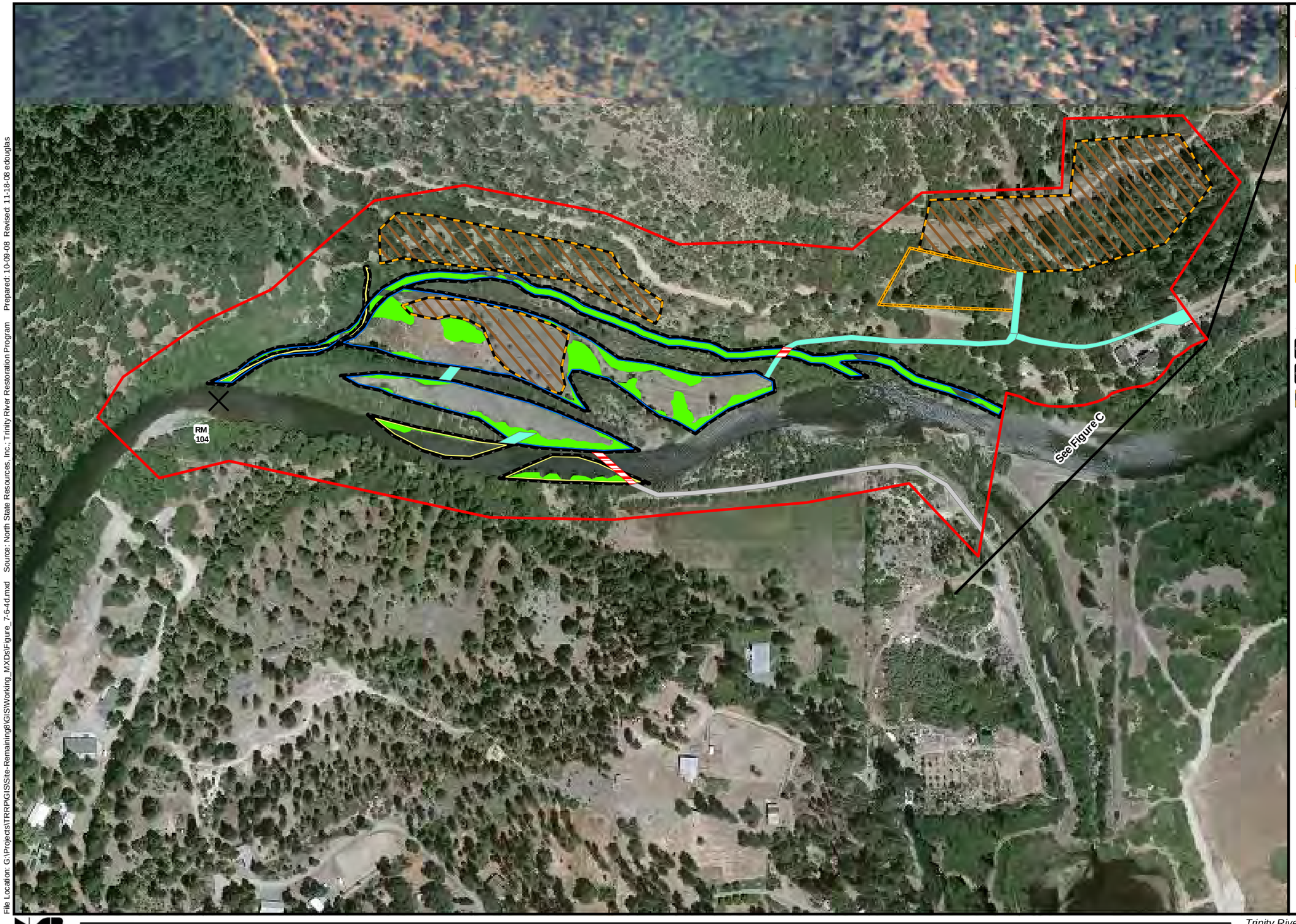
**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining\GIS\Working_MXDs\Figure_7-6-4c.mxd Prepared: 10-09-08 Revised: 11-18-08 edouglas Source: North State Resources, Inc.; Trinity River Restoration Program

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-4c**
**Lowden Ranch - Impacts of Proposed Project on Riparian Area Habitat**




- Site Boundary (43.695 acres)
- River Mile (RM)
- Matchline
- Riparian Area Habitat Impacts (2.786 acres)

**Construction Areas**

*Name*

- Access Road - Existing
- Access Road - New
- Crossing
- Staging Area

**Activity Areas**

*Area*

- In Channel
- Riverine
- Upland

N

1:3,000

250 0 250
Feet

**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7-6-4d.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-09-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-4d**
**Trinity House Gulch - Impacts of Proposed Project on Riparian Area Habitat**


Site Boundary (22.475 acres)

River Mile (RM)

Matchline

Riparian Area Habitat Impacts (1.191 acres)

**Construction Areas**

*Name*

Access Road - Existing

Access Road - New

Crossing

Staging Area

**Activity Areas**

*Area*

In Channel

Riverine

Upland

N

1:2,400

200 0 200

Feet

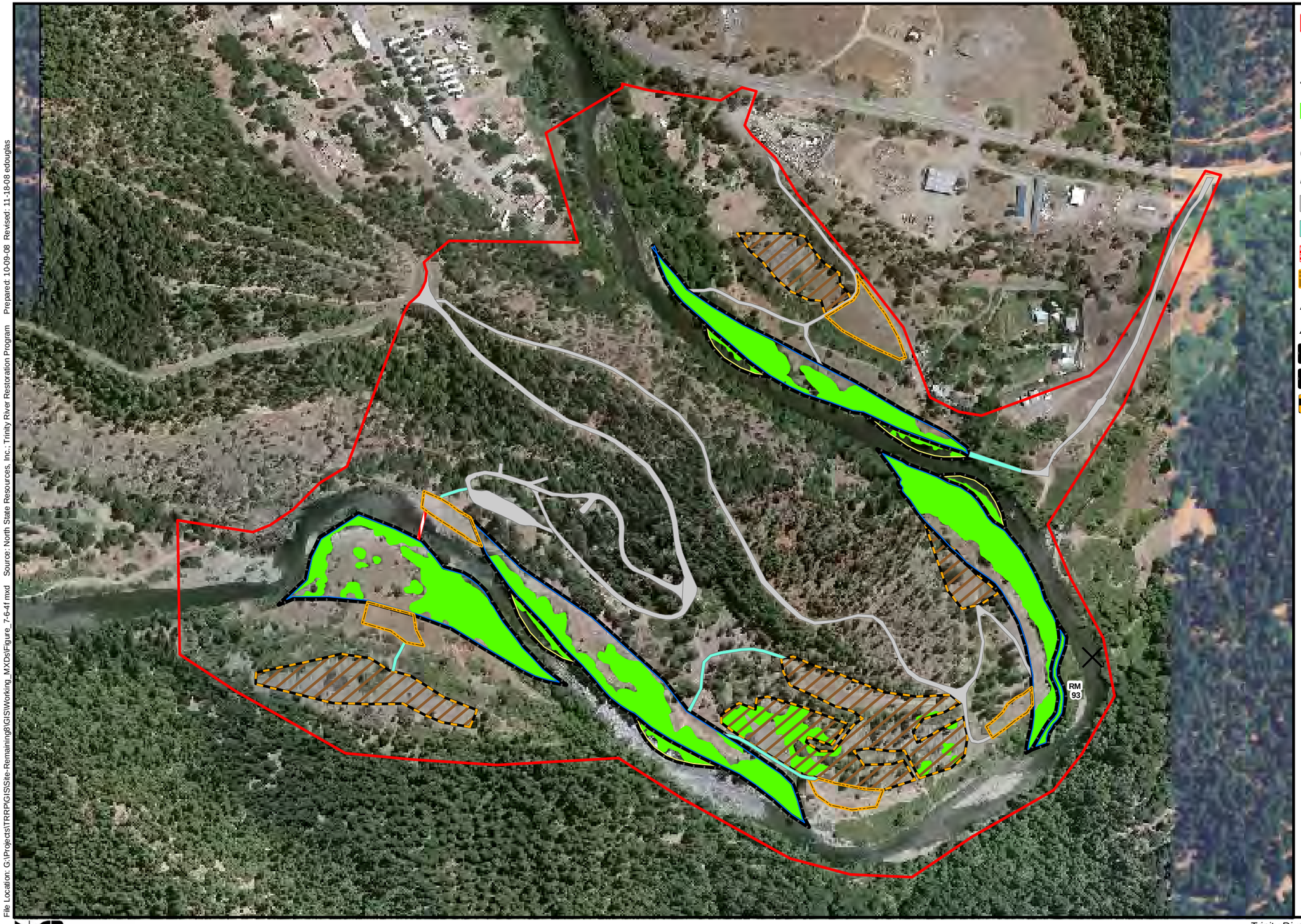
**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7-6-4e.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-09-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-4e**
**Steel Bridge Day Use - Impacts of Proposed Project on Riparian Area Habitat**




Site Boundary (135.871 acres)

River Mile (RM)

Matchline

Riparian Area Habitat Impacts (12.183 acres)

## Construction Areas

*Name*

Access Road - Existing

Access Road - New

Crossing

Staging Area

## Activity Areas

*Area*

In Channel

Riverine

Upland

N

1:4,200

350 0 350

Feet

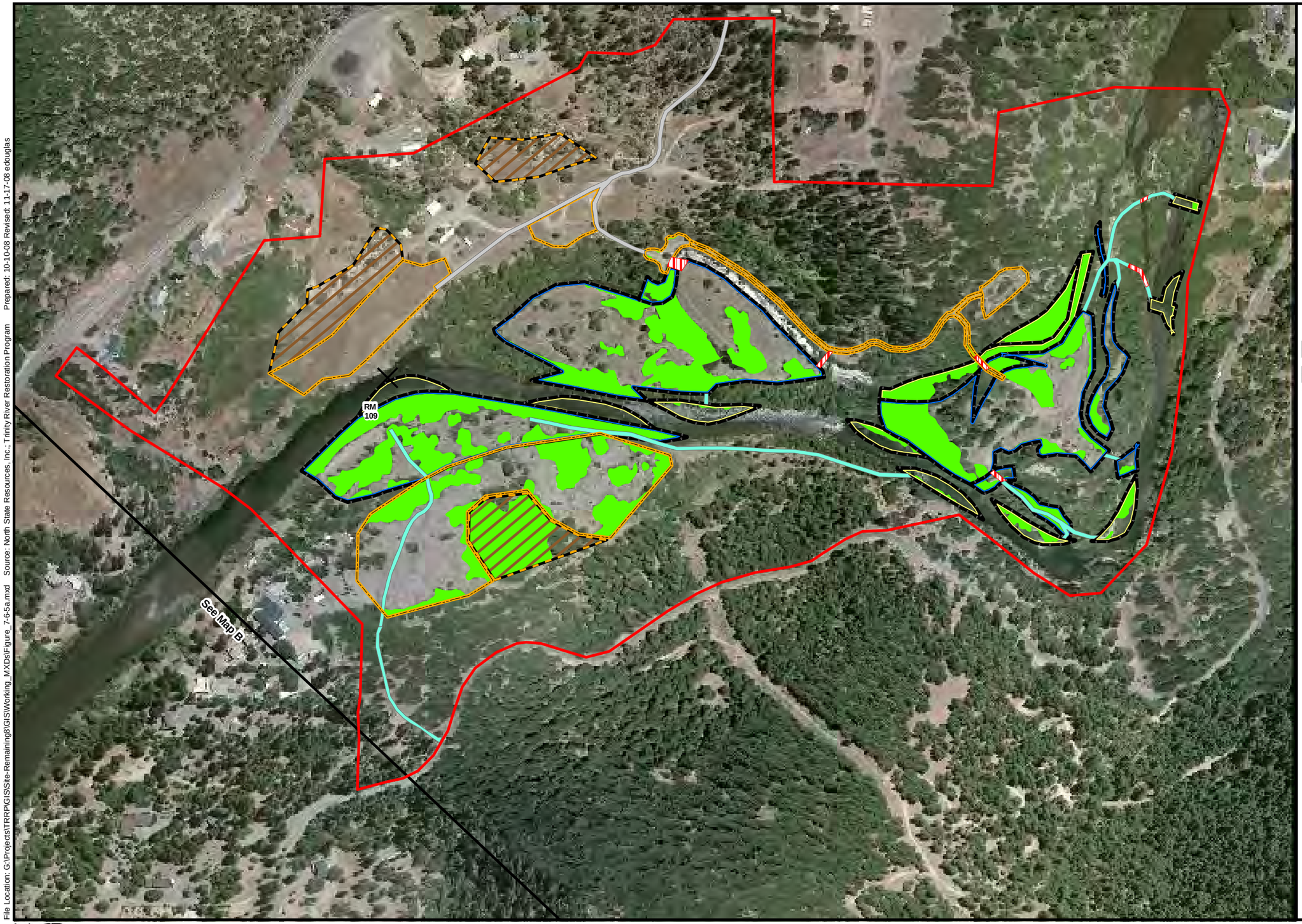
**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining\GIS\Working_MXDs\Figure_7-6-4f.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-09-08 Revised: 11-18-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-4f**
**Reading Creek - Impacts of Proposed Project on Riparian Area Habitat**




Site Boundary (103.421 acres)

River Mile (RM)

Matchline

Riparian Area Habitat Impacts (11.478 acres)

**Construction Areas**

*Name*

Access Road - Existing

Access Road - New

Crossing

Staging Area

**Activity Areas**

*Area*

In Channel

Riverine

Upland

N

1:3,600

300 0 300

Feet

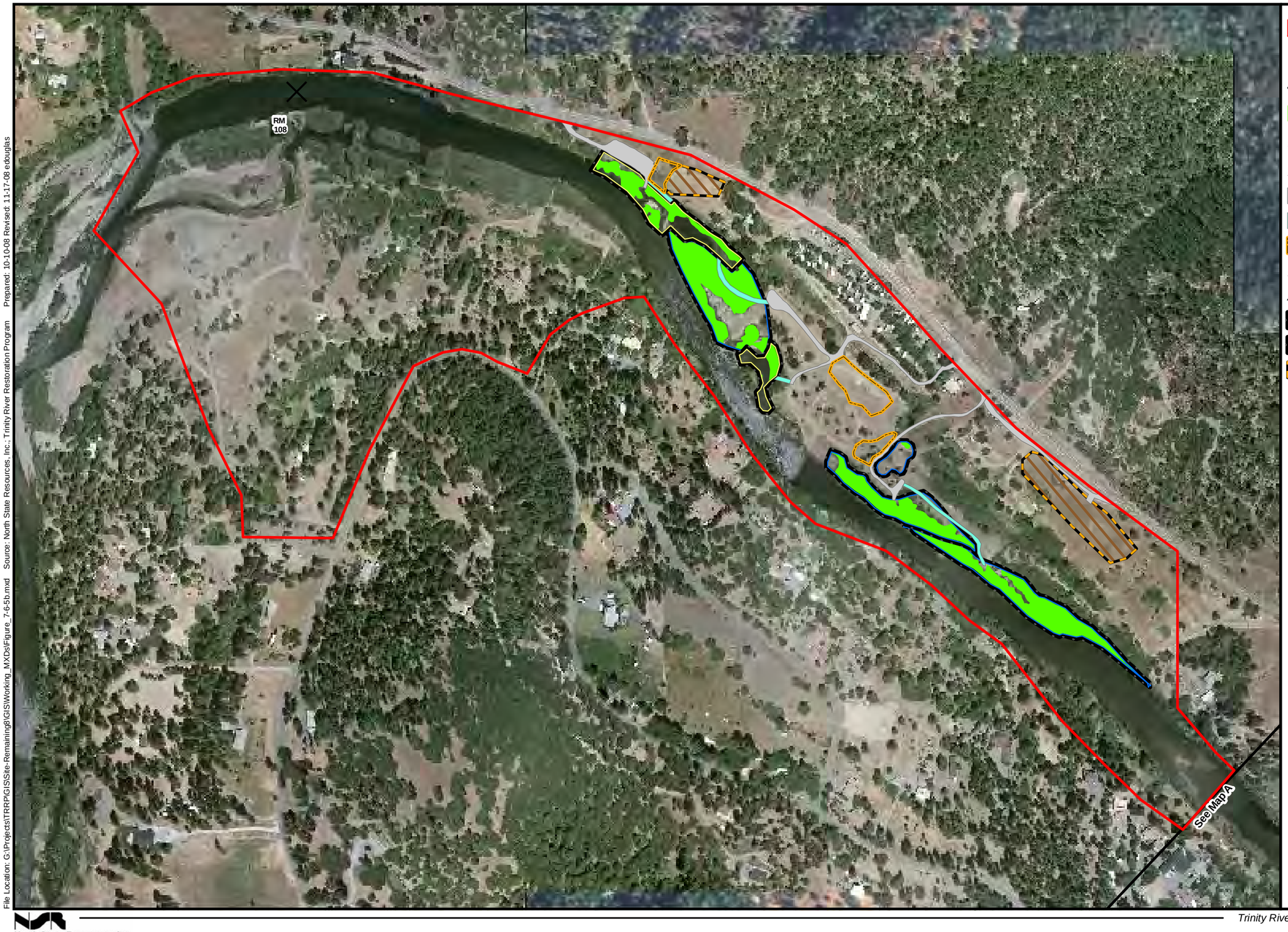
**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7-6-5a.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-10-08 Revised: 11-17-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-5a**
**Sawmill - Impacts of Alternative 1 on Riparian Area Habitat**




Site Boundary (92.274 acres)

River Mile (RM)

Matchline

Riparian Area Habitat Impacts (4.454 acres)

**Construction Areas**

*Name*

Access Road - Existing

Access Road - New

Staging Area

**Activity Areas**

*Area*

In Channel

Riverine

Upland

N

1:4,200

350 0 350

Feet

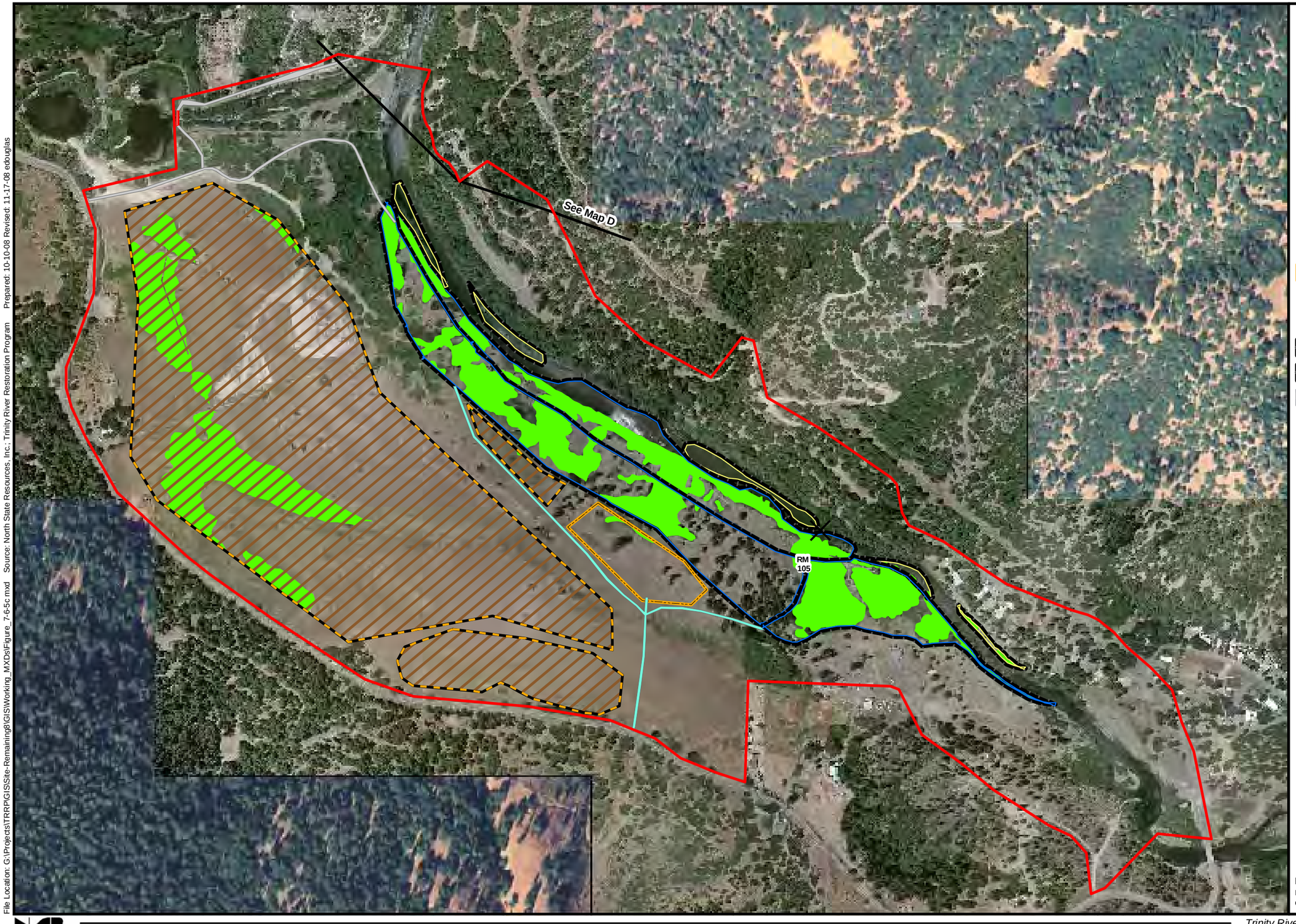
**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7-6-5b.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-10-08 Revised: 11-17-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-5b**
**Upper Rush Creek - Impacts of Alternative 1 on Riparian Area Habitat**




Site Boundary (211.769 acres)

River Mile (RM)

Matchline

Riparian Area Habitat Impacts (22.677 acres)

**Construction Areas**

*Name*

Access Road - Existing

Access Road - New

Crossing

Staging Area

**Activity Areas**

*Area*

In Channel

Riverine

Upland

N

1:5,400

450 0 450

Feet

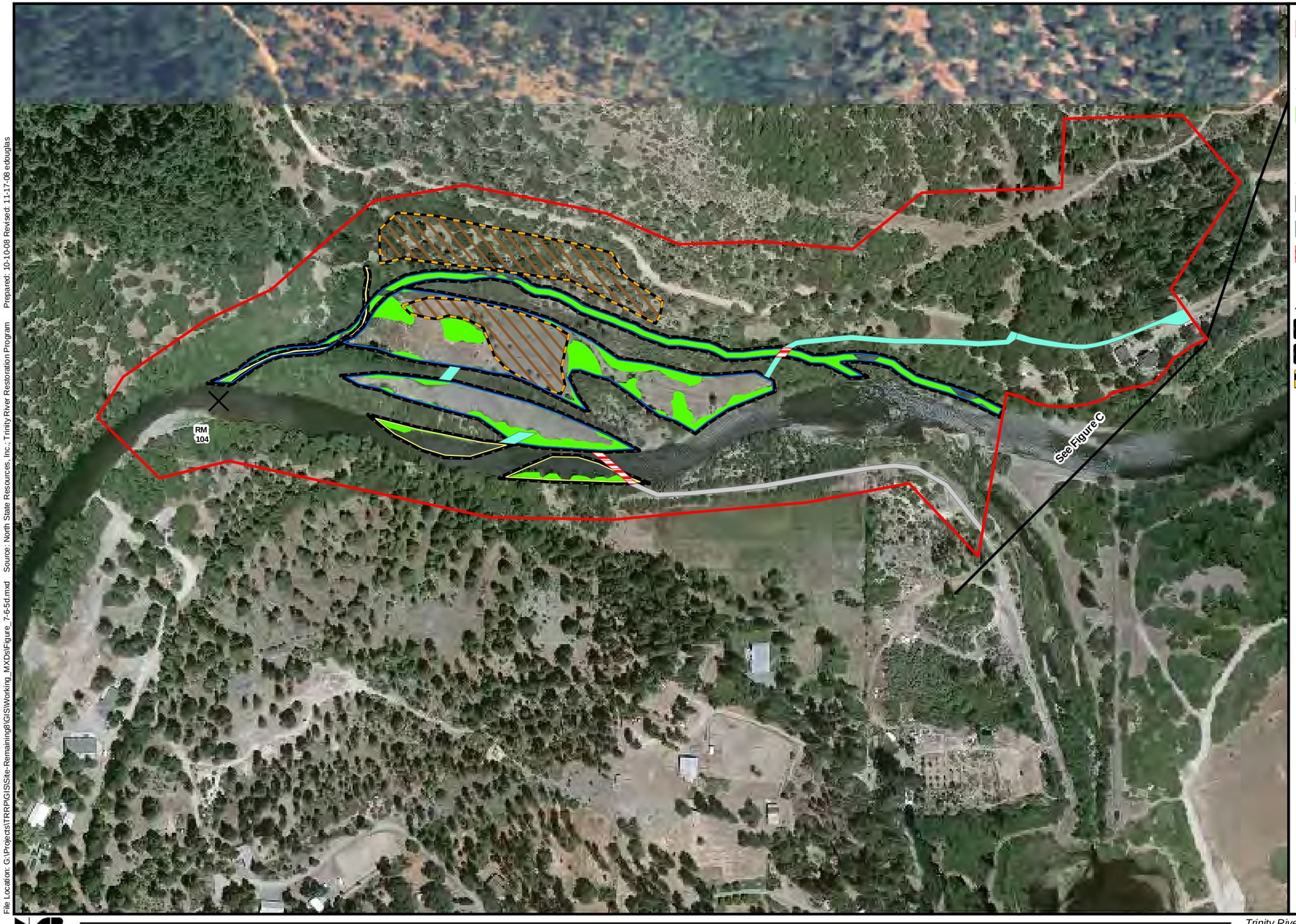
**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining\GIS\Working_MXDs\Figure_7-6-5c.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-10-08 Revised: 11-17-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-5c**
**Lowden Ranch - Impacts of Alternative 1 on Riparian Area Habitat**




Site Boundary (43.695 acres)

River Mile (RM)

Matchline

Riparian Area Habitat Impacts (2.785 acres)

**Construction Areas**

*Name*

Access Road - Existing

Access Road - New

Crossing

**Activity Areas**

*Area*

In Channel

Riverine

Upland

N

1:3,000

250 0 250

Feet

**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7-6-5d.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-10-08 Revised: 11-17-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-5d**
**Trinity House Gulch - Impacts of Alternative 1 on Riparian Area Habitat**


Site Boundary (22.475 acres)

River Mile (RM)

Matchline

Riparian Area Habitat Impacts (1.191 acres)

**Construction Areas**

*Name*

Access Road - New

Staging Area

**Activity Areas**

*Area*

In Channel

Riverine

Upland

N

1:2,400

200 0 200

Feet

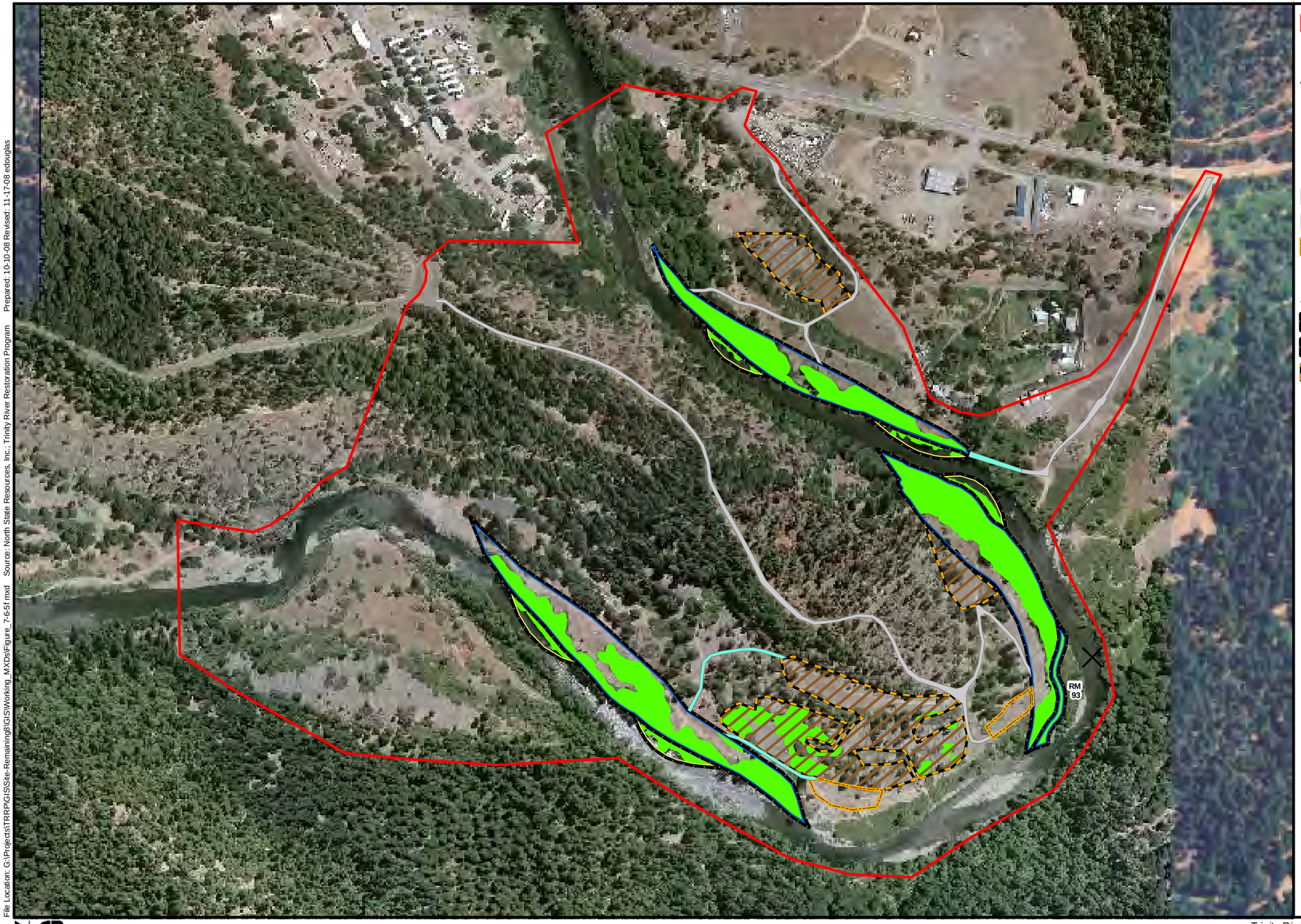
**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining8\GIS\Working_MXDs\Figure_7-6-5e.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-10-08 Revised: 11-17-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-5e**
**Steel Bridge Day Use - Impacts of Alternative 1 on Riparian Area Habitat**




Site Boundary (135.871 acres)

River Mile (RM)

Matchline

Riparian Area Habitat Impacts (9.488 acres)

**Construction Areas**

*Name*

Access Road - Existing

Access Road - New

Staging Area

**Activity Areas**

*Area*

In Channel

Riverine

Upland

N

1:4,200

350 0 350

Feet

**Note: Legend symbol swatches do not necessarily reflect map symbology based on rotation angle of north arrow.**

File Location: G:\Projects\TRRP\GIS\Site-Remaining\GIS\Working_MXDs\Figure_7-6-5f.mxd Source: North State Resources, Inc.; Trinity River Restoration Program Prepared: 10-10-08 Revised: 11-17-08 edouglas

North State Resources, Inc.

*Trinity River Restoration Program: Remaining Phase 1 Sites*

**Figure 7.6-5f**
**Reading Creek - Impacts of Alternative 1 on Riparian Area Habitat**

service vehicles to cross up to several times per week; otherwise, vehicle crossing traffic would be kept to a minimum. Access for heavy equipment and service vehicles could be required in the event that small private access roads with small turning radiuses (e.g., through the Salt Flat community) are impassable by construction equipment. Temporary gravel fill work ramps and low-flow channel crossings would be constructed at various locations (activity area X) 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 in and near the active low-flow channel is planned to occur during the summer and fall months (between July and December); however, access in and out of the sites could be required during other low-flow times as well. Construction of the crossings would only be conducted during late-summer, low-flow conditions (e.g., July 15–September 15). However, river crossings may be used on a reoccurring basis during the construction period (e.g., October - December). Consequently, it is likely that some of this work 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, the low-flow channel crossings would be dismantled and materials would be contoured to the river bottom. Fill materials would consist of appropriately sized spawning gravel.

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 as described in previous impact discussions.

Although the construction period could extend into the coho smolt emigration and coho salmon spawning season, the effect of the low-water crossings on fish passage is expected to be temporary and minimal. 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 are considered significant.

## Chinook Salmon

Potential impacts to Chinook salmon populations in the Trinity River resulting from implementation of the Proposed Project 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 site 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 over the crossings.

## Steelhead

Potential impacts to 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, Chinook Salmon, Steelhead, and Pacific Lamprey**

Potential fish passage impacts to these anadromous species would be less than those described for the Proposed Project. Specifically, the number of crossings would be reduced or excluded at five of the Remaining Phase 1 sites. Similar to the Proposed Project, adequate depth and velocities over the constructed crossing will allow both juvenile and adult passage. While long-term beneficial changes to physical rearing habitat associated with implementing Alternative 1 are anticipated, the temporary impacts on fish passage are considered significant.

## Mitigation Measures

### *No-Project Alternative*

No significant impacts were identified; therefore, no mitigation is required.

## Significance after Mitigation

Not applicable

### *Proposed Project and Alternative 1*

Mitigation measures detailed under Impact 4.6-6 in the Master EIR apply (section 4.6.2). No additional mitigation measures are required.

## Significance after Mitigation

Less than significant