Napa River Restoration: Oakville to Oak Knoll Project
Initial Study / Mitigated Negative Declaration

Napa County Conservation, Development & Planning Department
Napa County Flood Control and Water Conservation District

November 2013

Horizon
WATER and ENVIRONMENT

Napa River Restoration:
Oakville to Oak Knoll Project

Initial Study/Mitigated Negative Declaration

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LIST OF ACRONYMS

asl	above sea level
ATV	all-terrain vehicle
BAAQMD	Bay Area Air Quality Management District
Bay Area CAP	Bay Area Clean Air Plan
BMI	benthic macroinvertebrates
BMP	Best Management Practice
CAL FIRE	California Department of Forestry
CARB	California Air Resources Board
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CFS	California Freshwater Shrimp
CH_4	methane
CLOMR	Conditional Letter of Map Revision
CLSI	California Land Stewardship Institute
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
County	Napa County
CRHR	California Register of Historical Resources
CWA	Clean Water Act
CY	cubic yard
dB	decibel
dBA	A-weighted decibel
dbh	diameter at breast height
District	Napa County Flood Control and Water Conservation District
DOC	California Department of Conservation
DPS	distinct population segment
EB	east-bound
ESA	Endangered Species Act
F & G Code	Fish and Game Code
FEMA	Federal Emergency Management Agency
FMMP	Farmland Mapping and Monitoring Program
ft	feet
GHG	greenhouse gas
HCP	habitat conservation plan
HRA	health risk assessment
IS/MND	Initial Study Mitigated Negative Declaration
JSA	Jones and Stokes Associates
lb	pounds

L_{dn}	day-night (sound) level
L_{eq}	equivalent sound level
L_{max}	maximum sound level
L_{min}	minimum sound level
LOS	level of service
LWD	large woody debris
L_{xx}	percentile-exceeded sound level
Manual	Stream Maintenance Manual
mi	miles
MMRP	Mitigation Monitoring and Reporting Program
mph	miles per hour
MT	metric ton
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
Napa County BDR	Napa County Baseline Data Report
NB	north-bound
NCCP	Natural Community Conservation Plan
NCES	Napa County Office of Education
NCSD	Napa County Sheriff's Department
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCD	Napa Resource Conservation District
NRER	Napa River Ecological Reserve
OEHHA	California Office of Environmental Health Hazard Assessment
OHV	off-highway vehicle
OHWM	ordinary high water mark
PGE	Pacific Gas & Electric
PM	particulate matter
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppm	parts per million
Proposed Project	Napa River Restoration: Oakville to Oak Knoll Project
RCRA	Resource Conservation and Recovery Act
ROG	reactive organic gases
RWQCB	Regional Water Quality Control Board
SARA	Superfund Amendment and Reauthorization Act
SFBAAB	San Francisco Bay Area Air Basin
SPRP	Spill Prevention and Response Plan
SR	State Route
SVP	Society of Vertebrate Paleontology
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminants
TCP	Traffic Control Plan
TMDL	Total Maximum Daily Load
tpy	tons per year
USEPA	U.S. Environmental Protection Agency

USFWS	U.S. Fish and Wildlife Service
USCS	Unified Soil Classification System
USGS	U.S. Geological Survey
W:D	width to depth ratio
WB	west-bound
WDRs	Waste Discharge Requirements
$\mu g/m^3$	micrograms per cubic meter

Chapter 1
INTRODUCTION

Napa County (County), has prepared this Initial Study/Mitigated Negative Declaration (IS/MND) to provide the public, responsible agencies, and trustee agencies with information about the potential environmental effects of the proposed Napa River Restoration: Oakville to Oak Knoll Project (Project, or Proposed Project). This document was prepared pursuant to the requirements of the California Environmental Quality Act (CEQA) of 1970 (as amended) and the State CEQA Guidelines (14 California Code of Regulations 15000 et seq.).

1.1 Introduction

The Napa River is one of the few large watersheds in the San Francisco Bay Area which has not been widely urbanized and supports a wide range of wildlife and habitats. Napa County has been progressive in its land use planning to limit urbanization and protect local agricultural land use, while preserving and enhancing natural resources of the Napa River watershed. The County has undertaken projects to protect, enhance, or restore the Napa River, its floodplain, and watershed since the 1990s. Recent restoration efforts include the Napa River and Creek Flood Project, Zinfandel Bridge Fish Passage Project, and the Rutherford Restoration Reach Project. The Proposed Project at the Oakville to Oak Knoll reach of the Napa River is located immediately downstream from the Rutherford Reach Project. The Proposed Project provides continuity with the Rutherford Reach Project.

Habitat quality and river function in the Oakville to Oak Knoll project reach is degraded due to historic channel modifications, land use changes, and the influence of dams in the watershed that affect conditions both upstream and downstream. These processes have led to channel incision, bank destabilization, reduced functioning of in-channel features (riffles, bars, pools), a narrowed riparian corridor, and loss of floodplain connectivity with the mainstem Napa river and the six tributaries within the project reach. Some of the degraded habitat conditions in the mainstem Napa River are progressing into tributaries. The degraded channel also affects privately-owned lands along the river through increased bank failures, erosion, and flooding concerns. The Proposed Project seeks to address and improve these degraded conditions through restorative actions.

1.2 Project Goals and Objectives

The goals and objectives of the Proposed Project include:

- minimizing the need for ongoing channel stabilization and repair work by establishing a more self-sustaining channel design which reduces maintenance needs;

- enhancing geomorphic channel forms and processes to support a more diverse and complex instream condition;
- increasing river and floodplain interactions where possible;
- increasing and enhancing riverine, riparian, and floodplain habitat functions, with a focus to improve habitat for fish and wildlife;
- removing invasive nonnative vegetation and replanting with native vegetation that will not promote Pierce's disease in vineyards;
- supporting the sediment reduction and habitat enhancement goals of the Napa River Sediment Total Maximum Daily Load (TMDL); and
- coordinating with landowners to address their interests with regard to river adjacent farmland and property.

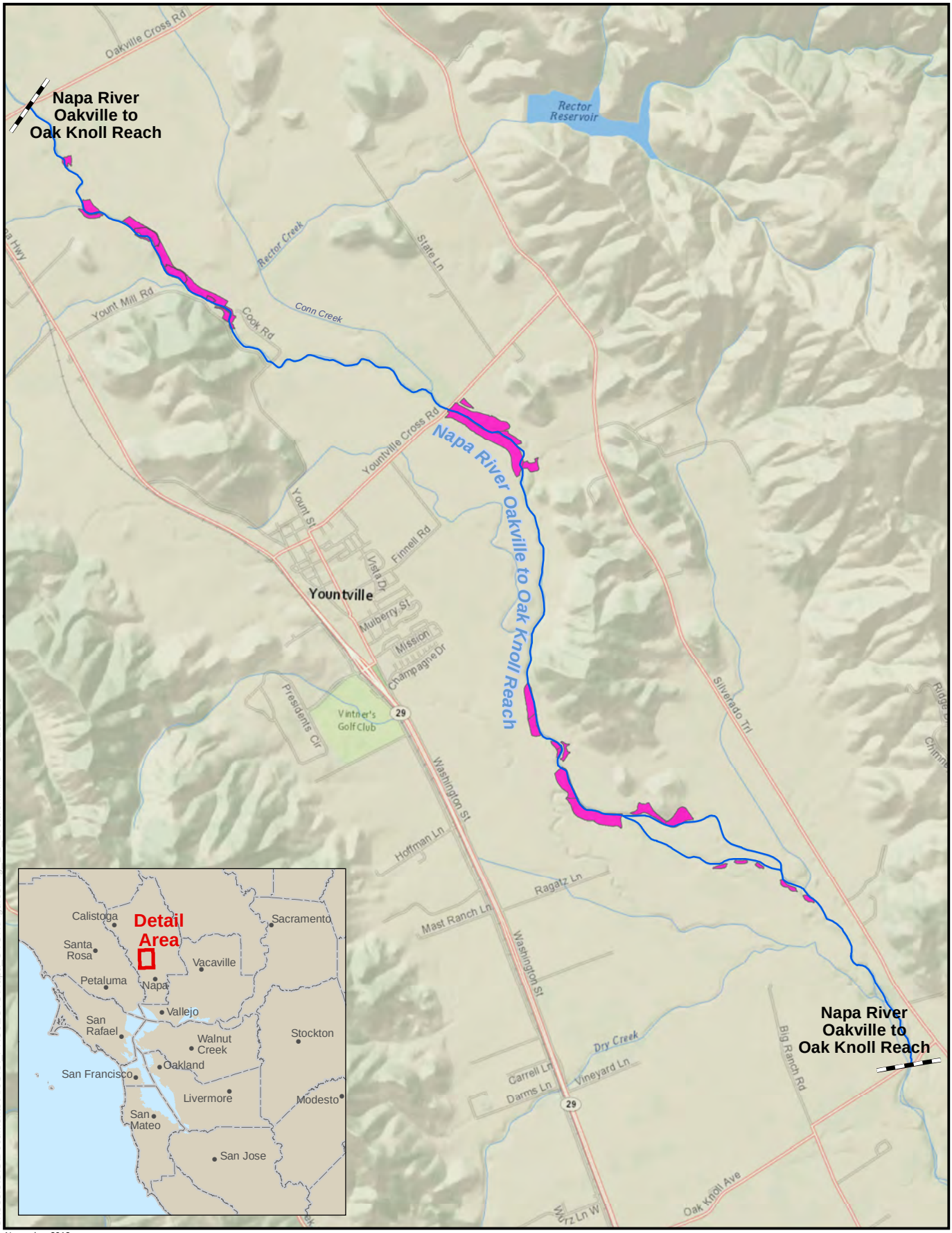
1.3 Project Location

The Proposed Project is located on the Napa River, in the central Napa River watershed, near the Town of Yountville (see **Figure 1-1**). The northern portion of the Project Area starts at the Oakville Crossroad Bridge and is located toward the western side of the Napa Valley floor, close to State Route 29. Toward the southern end of the project, near the Oak Knoll Avenue Bridge, the Napa River shifts more toward the eastern side of the valley floor closer to Silverado Trail. The Proposed Project would entirely occur on privately owned property and does not include any work on the Oakville Crossroad or Oak Knoll Avenue bridges.

1.4 Landowner Partnerships and Coordination

All land adjacent to the river channel in the Project Area is privately owned. The California Land Stewardship Institute (CLSI) is acting as the "landowner liaison" for the Proposed Project and is collaborating with the County to outreach with landowners along the Oakville to Oak Knoll Reach. A Landowner Advisory Committee (LAC) was formed and is open to all landowners in the project reach. The Oakville to Oak Knoll LAC will meet regularly during the planning, implementation, and monitoring phases of the project. The LAC was established to facilitate stakeholder engagement in the project and oversee Project implementation and maintenance activities implemented after the project is constructed to ensure is the project is functioning as designed.

Throughout the planning stages landowners will be integrally involved in the project and all restoration actions will require landowner approval prior to implementation. At each stage of design (30%, 65%, 90%, and 100% complete) landowners will review and approve the designs at each of the above stages and are encouraged to provide input, comments, and suggestions. Landowners were asked to sign a CEQA Agreement with the County to demonstrate their commitment to the project and to authorize technical studies to be performed on their property to advance Project designs. Landowners will be asked to sign a Temporary Construction Easement at the 65% stage to facilitate the construction of the project once the final designs are complete and construction permits are acquired. Once the Project is complete, landowners must sign a Long-Term Maintenance Access Agreement to allow the Napa County Flood Control and Water Conservation District (District) to monitor



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Basemap Source: ESRI

Proposed Restoration Sites

Proposed Project Reach

Figure 1-1
Proposed Project Location

the project and conduct maintenance as needed. The district will develop a maintenance and monitoring report that will be distributed to landowners each year. Annually, landowners can submit a maintenance request to the District for additional project-related maintenance work on their property.

Conservation easements may be established as part of the Project. The Land Trust of Napa County is a nonprofit organization that partners with landowners to establish conservation plans and easement agreements to permanently restrict land uses on their property, while maintaining ownership. Conservation easements can be donated to the Land Trust, who will be responsible for monitoring and managing the land. Project restoration Site 13, located south of Yountville Cross Road, was donated to the Land Trust as a conservation easement. The Napa Land Trust will participate in the LAC as a project stakeholder. In the future if there are opportunities to create additional conservation easements at other sites adjacent to the river, landowners may choose to work with the Napa Land Trust.

1.5 Intent and Scope of this Document

This IS/MND has been prepared in accordance with CEQA, under which the Napa River Restoration: Oakville to Oak Knoll Project constitutes a "project." The County, as the lead agency under CEQA, will consider the potential environmental impacts of project activities when it considers whether to approve the project. This IS/MND is an informational document to be used in the local planning and decision-making process. The IS/MND does not recommend approval or denial of the Proposed Project.

The IS/MND describes the Proposed Project and its environmental setting, including the Project Area's existing conditions and applicable regulatory requirements. This IS/MND also evaluates potential environmental impacts from the Proposed Project to the following resources:

- *Aesthetics*
- *Agricultural and Forestry Resources*
- *Air Quality*
- *Biological Resources*
- *Cultural Resources*
- *Geology, Soils, and Seismicity*
- *Greenhouse Gas Emissions*
- *Hazards and Hazardous Materials*
- *Hydrology and Water Quality*
- *Land Use and Planning*
- *Mineral Resources*
- *Noise*
- *Population and Housing*
- *Public Services*
- *Recreation*
- *Transportation and Traffic*
- *Utilities and Service Systems*

The Proposed Project incorporates measures to ensure there would be no significant adverse impacts on the environment. Over the long term, the project would benefit overall watershed functions, riparian and aquatic resources, and species located in the Project Area.

1.6 Public Involvement Process

Public disclosure and dialogue are priorities under CEQA. Accordingly, CEQA requires a period during the IS/MND process when interested stakeholders, interested public agencies, or the general public can provide comments on the impacts of the Proposed Project. Pursuant to Sections 15073.5 and 15105[b] of the CEQA Guidelines, the County is now circulating this document for a 30-day public and agency review. All comments received prior to 5:00 p.m. on the date identified for closure of the public comment period in the Notice of Intent will be considered.

Input, questions, or comments on this project can be sent to:

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Supervising Planner
Napa County Planning, Building, and Environmental Services
1195 Third Street, Suite 201
Napa, CA 94559
Email: brian.bordona@countyofnapa.org

1.7 Organization of this Document

This IS/MND document contains the following elements:

Chapter 1, *Introduction*. This chapter provides a brief project introduction, describes the goals and objectives of the project, summarizes the scope and contents of the IS/MND, provides contact information for commenting on the document, and describes impact terminology used in this document.

Chapter 2, *Project Description*. This chapter summarizes the Project, including descriptions of: the project purpose and goals; the project development process; project elements; project implementation and oversight; avoidance and minimization measures; and related permits and approvals.

Chapter 3, *Environmental Checklist*. This chapter presents the environmental checklist used to evaluate the Project's potential environmental effects. The checklist is based on the information provided in Appendix G of the state's CEQA Guidelines and Napa County's CEQA Guidelines. This chapter includes a brief environmental setting description for each resource topic and describes the Proposed Project's anticipated environmental impacts.

Chapter 4, *References*, provides a bibliography of printed references, web sites, and personal communications used in preparing this IS/MND.

Appendix A. 30% Complete Project Designs for the Napa River Restoration: Oakville to Oak Knoll Project

Appendix B. Mitigation Monitoring and Reporting Program (MMRP)

Appendix C. Air Quality and Greenhouse Gas Emissions Estimates

Appendix D. Lists of Special-Status Species Known to Occur in the Project Area

Appendix E. Oakville to Oak Knoll California Freshwater Shrimp Habitat Assessment

Appendix F. Oakville to Oak Knoll Cultural Resources Constraints Memorandum

Appendix G. Geotechnical Investigation Report for the Oakville to Oak Knoll Reach Napa River Restoration Project

1.8 Impact Terminology

This IS/MND uses the following terminology to describe environmental effects of the Proposed Project:

- A finding of *no impact* is made when the analysis concludes that the Project would not affect the particular environmental resource or issue.
- An impact is considered *less than significant* if the analysis concludes that there would be no substantial adverse change in the environment and that no mitigation is needed.
- An impact is considered *significant* if it results in a substantial adverse change in the physical conditions of the environment. Significant impacts are identified by using specific significance criteria as a basis of evaluation. Mitigation measures and/or alternatives are identified to reduce these potential effects on the environment.
- This IS/MND identifies particular mitigation measures that are intended to lessen project impacts. The State CEQA Guidelines (14 CCR 15370) define mitigation as:
  - avoiding the impact altogether by not taking a certain action or parts of an action;
  - minimizing impacts by limiting the degree or magnitude of the action and its implementation;
  - rectifying the impact by repairing, rehabilitating, or restoring the impacted environment;
  - reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
  - compensating for the impact by replacing or providing substitute resources or environments.

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Chapter 2
PROJECT DESCRIPTION

2.1 Project Background

Prior to agriculture and development in the Napa Valley, the Napa River, its floodplain, and riparian corridor supported extensive forest and wetland habitats. Much of this habitat has been reduced over time. Prior to development, the Napa River was a broad, shallow river system with multiple channels. The Napa River is now generally confined to a single channel that is often deeply incised. Much of the river corridor is bound by flood berms at the top of the river banks to protect neighboring properties from flooding. The constricted channel and levees disconnect the river from its adjacent floodplain terraces. This confinement keeps the channel zone fairly homogenous in terms of instream complexity features such as bars, benches, pools, alcoves, etc. This lack of geomorphic complexity results in a less diverse riparian community and reduced quality and quantity of instream habitat for native aquatic species such as Chinook salmon, steelhead, and California freshwater shrimp. The constricted Napa River has also affected local agricultural landowners. The constricted channel condition has resulted in bank erosion and slumping in several locations; resulting in the loss of valuable vineyard land and infrastructure.

In 2007, the California Land Stewardship Institute (CLSI) received funding from the California State Water Resources Control Board (State Water Board) and Napa County (Measure A) to prepare an enhancement plan for the Oakville to Oak Knoll reach of the Napa River. The *Napa River Restoration: Oakville to Oak Knoll Final Concept Plan* (Concept Plan) was developed by CLSI in 2011. To support development of the Concept Plan, several natural resource studies were conducted including a LIDAR based physical survey, a geomorphic and ecologic assessment, and a hydrodynamic river model. The riparian habitat assessment included field surveys and data collection of tree species, density, size, ecological succession, regeneration, and location in the channel or riparian corridor. In support of the Concept Plan, fish habitat assessments were conducted by the Napa Resource Conservation District (NRCD) and habitat typing, snorkel, and spawning surveys. The fish habitat assessment quantified and evaluated instream habitat features, such as riffles, pools, woody debris structures, riparian cover, and vegetation diversity. Water temperature was continuously monitored with handheld thermometers throughout the survey. Streamflow was recorded at the USGS stream gauge at Oak Knoll Avenue.

Based on these natural resource studies, the Concept Plan identified 32 potential sites for restoration and developed the following project goals:

- Increase habitat areas on contiguous sites and adjacent to existing habitat areas, such as the Napa River Ecological Reserve, to increase the size and diversity of habitat nodes.
- Increase habitat areas by converting uplands, fallow agricultural land, and to a very limited extent, vineyard to habitat areas.

- Address actively eroding bank areas to reduce sediment loading and property loss.
- Avoid losing existing habitat areas to the greatest degree feasible. The exception is riparian areas with spider trees which are unlikely to survive for a long period.
- Avoid removal of old growth riparian forest.
- Avoid removal of riparian canopy over long reaches of channel where high levels of salmonid spawning and rearing occur.
- Avoid restoration actions near bank areas with numerous structures.

The Concept Plan developed preliminary restoration actions at each site and ranked them based on the potential to meet project goals and obtain landowner approval. The Proposed Project is the result of the Concept Plan's project ranking and alternatives analysis and includes a suite of channel and riparian restoration elements on 23 sites. **Table 2-1** below provides a translation of the sites identified in the Concept Plan and those included in the Proposed Project. As landowner discussions progressed after the Concept Plan was complete, many of the sites included in the Concept Plan were not carried forward in the Proposed Project.

Table 2-1: Comparison of Site Numbers in the Concept Plan and Proposed Project

Concept Plan Site Numbers	Proposed Project Site Numbers
28	23
27	22
29	21
26	20
26	19
26	18
26	17
26	16
26	15
18	14
17	13
16	12
14	11
13	10
12	9
11	8
10	7
9	6
8	5
7	4
5	3
3	2
2	1

2.2 Proposed Project

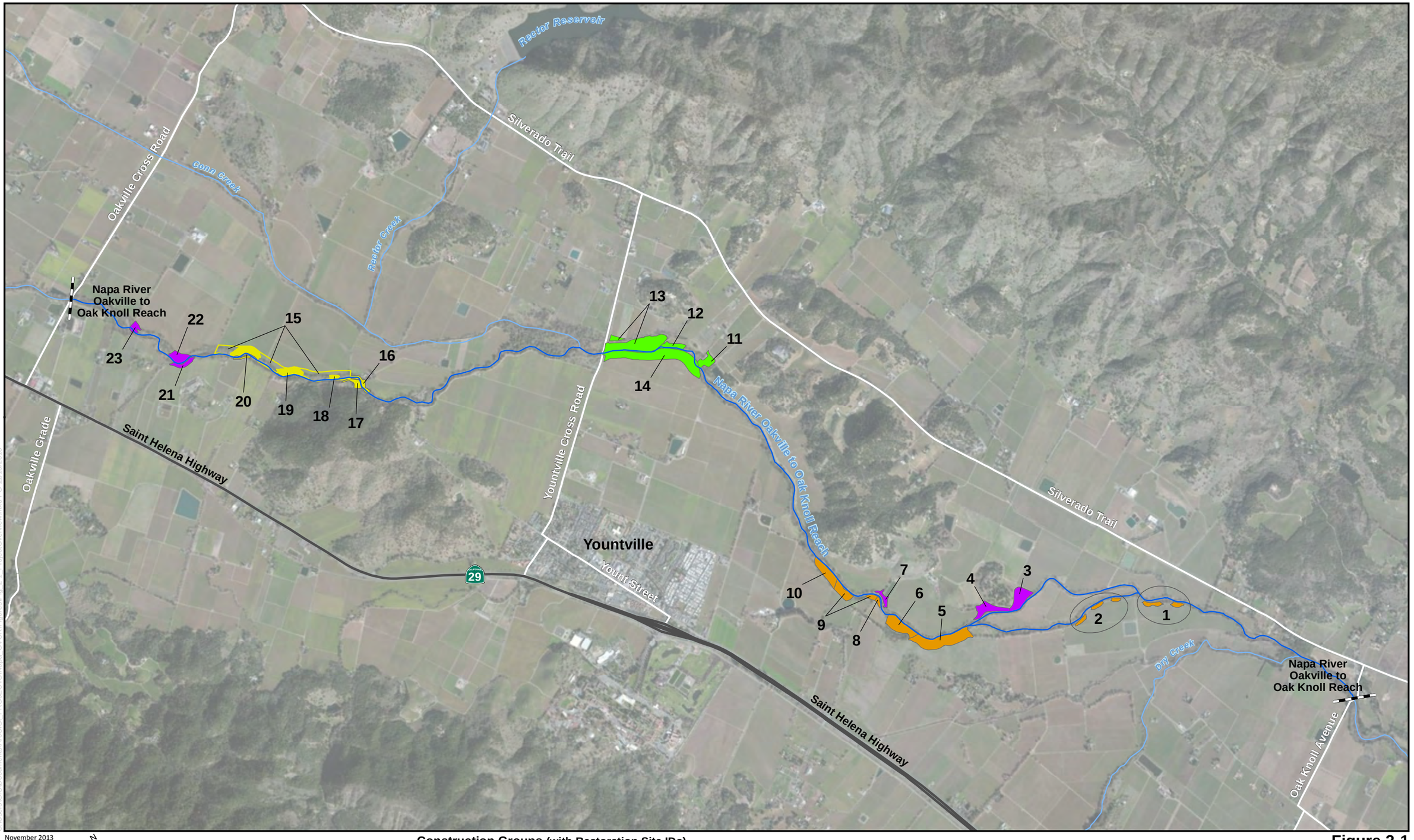
The proposed Napa River Restoration: Oakville to Oak Knoll Project (Proposed Project) includes 4.8 miles of active channel restoration activities along 9 miles of the mainstem Napa River between the Oakville Cross Road Bridge and the Oak Knoll Avenue Bridge (**Figures 2-1, 2-2a, and 2-2b**). The purpose of the Proposed Project is to restore and enhance long-term river and floodplain function, improve the quality and resilience of aquatic and terrestrial riparian habitat, and reduce property damage and sediment delivery associated with ongoing bank erosion processes.

The Proposed Project includes restoration elements and features to widen the channel, reduce channel bank erosion, improve the quality and resilience of aquatic and terrestrial habitat, and enhance overall channel and floodplain function along the Napa River. The Proposed Project would encompass 108 acres in total. The Project includes approximately 83 acres of grading that would impact approximately 55 acres of existing riparian and upland habitat. The Project includes removal of approximately 36 acres of vineyards, and restoration of 84 acres of transitional riparian and channel habitat. **Table 2-2** lists the affected properties and acreage included in the Proposed Project.

Table 2-2: Proposed Project Affected Parcels

Restoration Site ID	Parcel Assessment Number	Property Owner*	Total Parcel Area (Acres)	Affected Acreage
23	31080031000	Franciscan Vineyards Inc	215.75	1.4
22	31080031000	Franciscan Vineyards Inc	215.75	2.9
21	31080005000	Jackson Family Estates I LLC	71.83	1.6
20	31110003000	State Farm Ranch LLC	185.02	3.8
	31100030000	Gamble, Tom	11.47	0.5
19	31110003000	State Farm Ranch LLC	185.02	3.2
18	31110003000	State Farm Ranch LLC	185.02	0.6
17	31140007000	Gamble, Tom	1.1	0.1
	31140002000	Gamble George T TR	0.97	0.2
	31140003000	Gamble George T TR	1.74	1.1
16	31110018000	Gamble George T & Collette Y	2.5	0.6
	31110021000	Gamble George T & Collette Y	9.64	0.3
	31140010000	Pelissa and Hale	1.74	0.7
15	31110003000	State Farm Ranch LLC	185.02	13.7
14	36010027000	Treasury Wine Estates Americas Company	43.68	4.6
	36010028000	Treasury Wine Estates Americas Company	43.43	3.0
	36010026000	Treasury Wine Estates Americas Company	52.49	9.3
13	31220017000	Missimer Family Limited Partnership	43.22	13.4
12	31220016000	Traina J Todd Buchanan ETAL	22.57	2.4
11	31220014000	Yahome Vineyards LP	23.72	2.6
10	36010013000	Miller Vineyards LLC	190.12	4.5
9	36110034000	Massa	27.68	3.9
8	36110027000	Dambrosio Brothers Investment Company	30.09	0.6
7	39040050000	Robert Mondavi Properties Inc	92.61	0.1
	39040052000	Robert Mondavi Properties Inc	344.45	1.2
6	36100020000	C Mondavi and Sons Inc	115.9	6.2
5	36100020000	C Mondavi and Sons Inc	115.9	11.9
4	39040052000	Robert Mondavi Properties Inc	344.45	4.3
3	39040052000	Robert Mondavi Properties Inc	344.45	5.3
2	36120063000	Silverado Premium Properties	39.01	1.5
	36120066000	Silverado Premium Properties	166.29	0.5
1	36120066000	Silverado Premium Properties	166.29	2.1

Notes:
*Data derived from the Napa County Assessor's Parcel database and may not reflect the most current landowner information.
Source: ESAPWA 2013



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Basemap Source: ESRI

Construction Groups (with Restoration Site IDs)

Group A Group B Group C Group D

Proposed Project Reach

Figure 2-1
Proposed Project Overview

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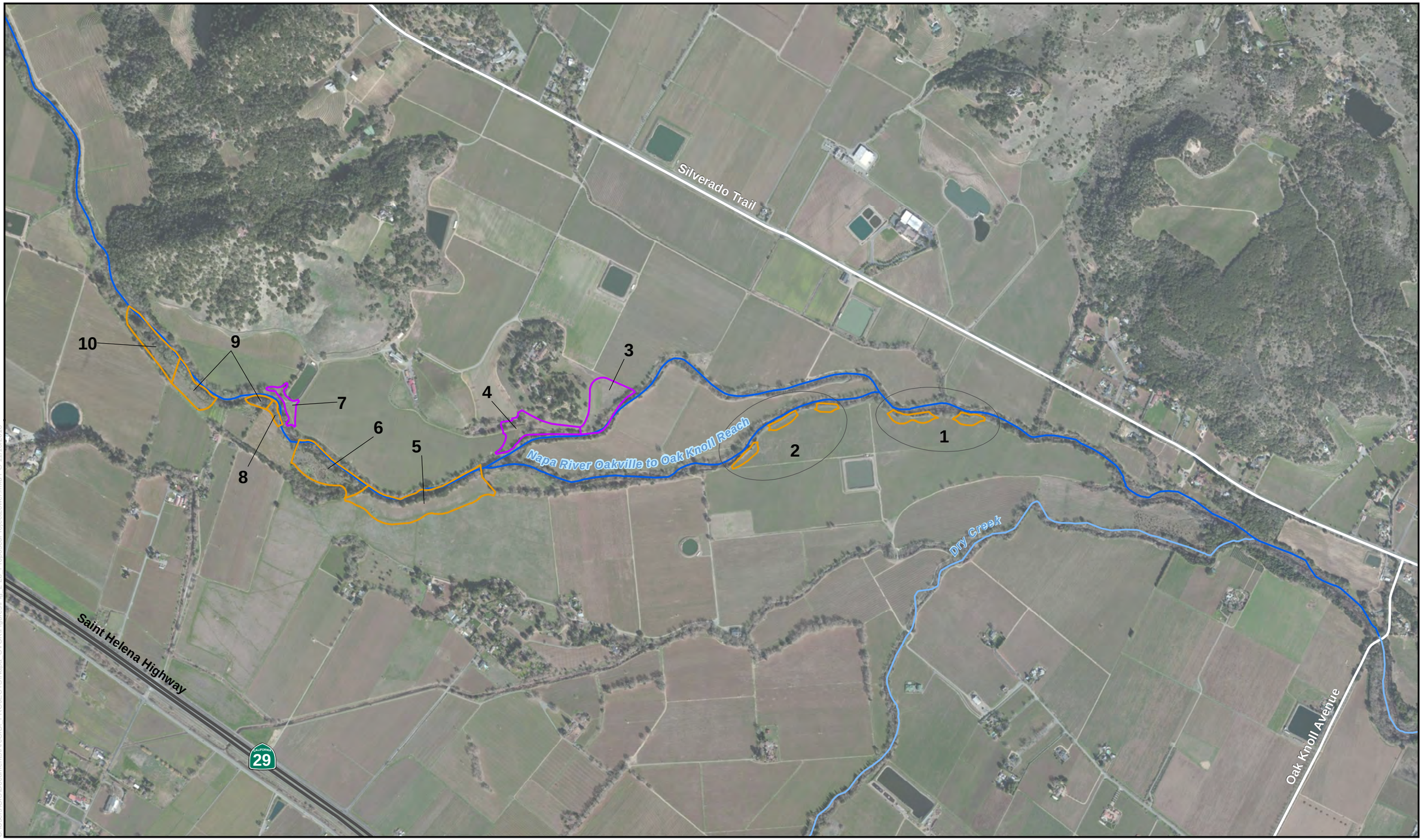
Basemap Source: ESRI

Construction Groups (with Restoration Site IDs)

Group A Group B Group C

Figure 2-2a
Proposed Project - Upper Reach



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Basemap Source: ESRI

Construction Groups (with Restoration Site IDs)

Group A Group D

Figure 2-2b
Proposed Project - Lower Reach

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2.3 Project Restoration Elements

The project has several design elements that are intended to restore physical and biologic processes to the Napa River including channel widening, floodplain restoration, biotechnical stabilization, in-stream habitat structures, managed retreat, and vegetation management. This section describes the general restoration elements and features that will be applied throughout the Proposed Project.

The Concept Plan (CLSI, 2012) identified restoration elements at each site based on existing geomorphic and hydraulic conditions, known constraints, and potential opportunities for habitat improvements. The ESA-PWA team, in concert with private landowners, CLSI, and Napa County, has refined the Concept Plan based on extensive landowner input and additional detailed geomorphic, geotechnical, and fisheries site assessments conducted in 2012 and 2013. An annotated description of each refined restoration concept is provided in Section 2.3 and summarized in **Table 2-3**.

The 30% complete project designs for the Proposed Project are included in Appendix A. The exact details for the positioning, orientation, and sizing of specific elements (large wood structures, willow baffles, flood benches, etc.) and target grading elevations will be refined following additional site-specific detailed topographic surveys, hydraulic modeling, and ongoing landowner input. As the Project proceeds through the final design phases, the restoration elements will be further refined on a site-by-site basis. However, the design refinement process will not result in any expansion of project footprints beyond those proposed in this document.

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Table 2-3: Project Design Criteria and Objectives

Action	Physical Objective	Biological Objective	Landowner Objective	Design Criteria
Stabilize actively eroding banks with biotechnical methods (replacing rip rap where appropriate)	Reduce steep bank angles	Provide stable slopes for regeneration of riparian forest and improvements in California freshwater shrimp (CFS) summer and/or winter habitat	Reduced bank erosion, reduce damages to property and infrastructure	Cut to 3:1 or flatter where bank-top constraints permit. Use living native plant materials (vegetated soil lifts, willow mattresses etc.) where shear stresses permit (using similar approach to Fischenich, 2001). Where shear stresses exceed resistance of purely biotechnical methods use rock with native vegetation (e.g. rock with willow pole plantings).
	Reduce bank erosion	Reduce infilling of spawning gravel, and improve substrate conditions for benthic macroinvertebrates (BMIs)		
	Remove rip rap	Improved bank edge habitat and improved summer habitat for CFS		
Widen selected reaches ("restoration nodes") to create inset floodplain benches and secondary channels	Reduce flow velocity on edge of channel	Provide high flow velocity refugia for juvenile salmonids	Out of bank flows will be slower and less damaging to inundated vines and infrastructure	Where bank-top constraints permit floodplain nodes should be on average 10x wider than the depth between historic floodplain and channel thalweg (based on reference conditions in the project vicinity). Nodes should be longer than 500 feet where feasible (based on reference conditions in the project vicinity). Shorter features should still function as alcoves and refugia, but are not expected to achieve the full range of geomorphic functions. Grading should minimize impacts to mature native trees both on the historic floodplain and on the channel edge (creating tree-islands). Floodplain benches should have significant areas that inundate on an annual basis between January and May, with the majority of the bench inundating two years out of three. Based on experience from the Rutherford Reach, floodplain benches should be approximately
	Induce gravel deposition in channel	Provide in-channel spawning and rearing habitat, and improve substrate conditions for BMIs		
	Induce fine sediment deposition in floodplain	Reduce infilling of spawning gravel, and improve substrate		

Action	Physical Objective	Biological Objective	Landowner Objective	Design Criteria
		conditions for BMIs		2-6 feet above the thalweg, with heterogeneity to provide a range of inundation depths across a wide range of flow conditions and water years. Hydraulic modeling should be used to confirm final design elevations. Benches should have variable widths to create convergent and divergent flow conditions and sustain riffle-pool maintenance. Where feasible wider sections should coincide with existing riffle crests. Benches may integrate mature tree preservation with creation of constrictions. Flow velocities on the majority of the floodplain should be lower than 2 feet/sec during the Q1.5 year flow, with velocities in the secondary channels lying between mainstem and floodplain velocities to promote heterogeneity and create feeding lanes. Banks should be cut to 3:1 or flatter where bank-top constraints permit. Use living native plant materials (willow baffles, fascines, etc.) where shear stresses permit (using similar approach to Fischenich, 2001). Where shear stresses exceed resistance of purely biotechnical methods use vegetated rock.
	Reduce bank erosion	Reduce infilling of spawning gravel, and improve substrate conditions for BMIs	Reduce bank erosion	
	Inundate floodplain and secondary channel areas	Create floodplain rearing opportunities for juvenile salmonids		
	Reduce steep bank angles	Provide stable slopes for regeneration of riparian forest		
	Set back agricultural berms and develop standardized replacement berms		Standardization of berm elevations and inundation frequencies. More stable engineered berms.	Where flood control berms are set back the design height of the setback berms will be coordinated to provide more uniform flood protection throughout the restoration sites. ESA PWA will confirm the calculated berm elevations for consistency with the berm elevations used in the post-project hydraulic model and other supplemental hydraulic analyses conducted to document anticipated post-project flood conditions. Other berm dimensions are based on the preliminary design for rolling berms, with 3:1 and 8:1 side slopes on the river side and vineyard side, respectively. The top widths will vary from 15 to 25 feet wide, depending on specific landowners' use. Berms will also be designed according to recommendations from the geotechnical report prepared by A3GEO (Appendix G).
Add in-channel large wood	Break up uniform glides and create complex hydraulics, increase geomorphic	Create shelter for juvenile and adult salmonids, create feeding lanes, create complex habitat and clean spawning gravel.		Density of in-channel wood shall range from one (1) piece of large wood every 20 feet to one (1) every 240 feet. The minimum diameter shall be 1.5 feet. The maximum dimensions of a large wood structure are 6-foot structure height and encroachment length 1/3 of the channel width. Encroachment length and height may be reduced depending on final stability calculations and impacts to base flood elevations.

Action	Physical Objective	Biological Objective	Landowner Objective	Design Criteria
	complexity, sort sediment			Where feasible logs should be stabilized using bank embedment and rock ballast, with cable used only where structures cannot be stabilized using this approach. Anchoring of the structures should consider buoyancy, hydrodynamic pressure, debris impact, and channel scour and be stable during an event with 25 recurrence interval. Generally log structures will be located to function in conjunction bench and channel geomorphic features. For example logs with intact rootwads may be oriented to maintain pools through inducing high scour zones, or low profile logs may be oriented to trap sediment.
Add in-channel roughness boulders	Break up uniform glides and create complex hydraulics, sort sediment, induce bed aggradation	Create shelter for juvenile and adult salmonids, create feeding lanes, create complex habitat and clean spawning gravel		Generally, boulder structures will be located to function in conjunction with floodplain bench and channel geomorphic features. For example low profile boulders may be oriented to trap sediment. Roughness boulders may be placed along the channel margin to enhance alternating bar accumulation.
Augment channel with gravel	Locally reverse channel incision and increase channel complexity	Increase the area of spawning gravel; create substrate for BMIs to support native fish; cover clay hard pan reaches; break up long glides to reduce predation of native fish by non-natives.		Gravel should be sized to be suitable for Chinook salmon and Steelhead spawning activities. Augmentation must not cause increased flooding at structures or where landowners are not willing to accept locally increased inundation of surrounding land. Augmentation must not cause burial or backwatering of similar lengths of existing high quality habitat Target sites that have sufficient potential gradient to aerate water and create good temperature / water quality / rearing or spawning conditions but that lack substrate (e.g. add gravel to steep sites with clay substrate) Increase gradient of flat glides where this will not drown out upstream habitat (e.g. downstream of knickpoints) and where the reach can be widened to make the steeper bed sustainable (i.e. achieve a steeper equilibrium gradient than under existing conditions) Narrow over-widened glides to increase flow concentration and velocity where steepening would drown out upstream habitat

Action	Physical Objective	Biological Objective	Landowner Objective	Design Criteria
				The channel dimensions shall be sized to provide the desired bar inundation frequency to promote macro invertebrate productivity. Where riffle-pool-bar formation and maintenance is desired, slopes shall be limited to less than 2%. As needed, gravel placement shall be stabilized using roughness boulders or grade control structures.
Floodplain Restoration		Provide partial treatment of agricultural runoff, provide wetland areas	Improved quality of runoff	Retain runoff from agricultural ditches for 48-72 hours (complying with vector control requirements). Wetlands should be planted with emergent wetland vegetation.

Source: ESAPWA 2013

2.3.1 Channel Widening

The Proposed Project will widen the channel in several locations. The Concept Plan suggests that physical habitat-forming processes are currently limited by low width to depth (W:D) ratios. Well-developed bars and riffle pool sequences were observed at W:D ratios of 8:1 and above (CLSI, 2012). The proposed channel widening activities would increase the W:D ratios of specific project sites to the extent practicable; on the order of 8:1 to 10:1 depending on lateral constraints and existing environmental resources. Channel widening will enhance the physical processes that sustain aquatic habitat and also allow juvenile fish access to floodplain areas for feeding while increasing the growth and recruitment of riparian tree species vital to the stream ecosystem. Channel widening also produces a less erosive channel and reduces the need for bank armoring practices. **Figure 2-3** illustrates the conceptual channel incision and widening process.

Channel widening would be most appropriate where W:D ratios are considered severely entrenched (2.5:1 to 5.5:1) and where landowners provide opportunities for lateral expansion of the riparian corridor. To the extent feasible, existing riparian trees that line the channel and within 1 to 2 feet of proposed grades will be preserved to maintain existing canopy coverage over the channel. Where required, trees and vegetation within the grading limits will be removed and reused in constructing instream wood structures. All channel widening features would be planted with a mix of transitional riparian and upland species and include large wood structures and willow baffles for habitat complexity. See Section 2.3.7 for further discussion on site revegetation.

Channel widening will require both mechanical and hand labor. Mechanized equipment such as loaders, scrapers, rollers, compactors, bobcats, and excavators would be used where more extensive grading activities are required and to reconstruct flood berms. Hand grading with trowels, shovels, and other manually operated tools would be employed in sensitive areas to minimize disturbance. Onsite soils are suitable for general fill requirements and will be repurposed to construct setback berms where allowed. If specific site soils are found to be geotechnically unsuitable haul trucks will be used to import the appropriate material from other restoration sites. Haul trucks would also be used to export excess materials for reuse or offsite disposal. The following channel widening activities have been designed to maximize habitat benefits relative to cost and disturbance.

Benches

Flood benches are elevated topographic features adjacent to the channel that are inundated (flooded) during specific discharges. Flood benches provide rearing and holding habitat for salmonids during high flow events and influence the formation and maintenance of riffle pool morphology. Benches would be designed on a site specific basis and would vary in width based on land use and environmental constraints. Where feasible, flood benches would be placed to maximize inundation frequencies. Topographic complexity would be integrated into flood bench features by incorporating existing vegetation to break up uniform channel flow lines and promote sediment sorting and deposition.

Berm & Bank Setbacks

Berm and bank setbacks reverse the historical pattern of river constriction by relocating berms and banks away from the channel. Existing berms are rebuilt and channel bank

profiles are flattened to provide a larger channel cross section and higher width to depth ratios.

Berm and bank setbacks would extend into adjacent private land on one or both sides of the river. In each scenario newly graded berms and banks would be stabilized with biotechnical measures and then planted with native riparian species. Berms and banks would be flattened to a slope of 3:1 or flatter. Where feasible a bench would be graded at the base of or opposite to the stabilized bank to provide greater connectivity and off-channel habitat during high-flow events.

All channel widening, bank grading, and instream project elements will be designed to maintain or improve the current level of flood protection. Preservation of existing flood protection will be documented with the County floodplain administrator in conformance with the County Flood Control Ordinance or a formal Conditional Letter of Map Revision and Letter of Map Revision subsequent to project implementation. Maintenance of set-back berms will be the responsibility of private landowners and Napa County under the Oakville Oak Knoll Stream Maintenance District.

Alcoves

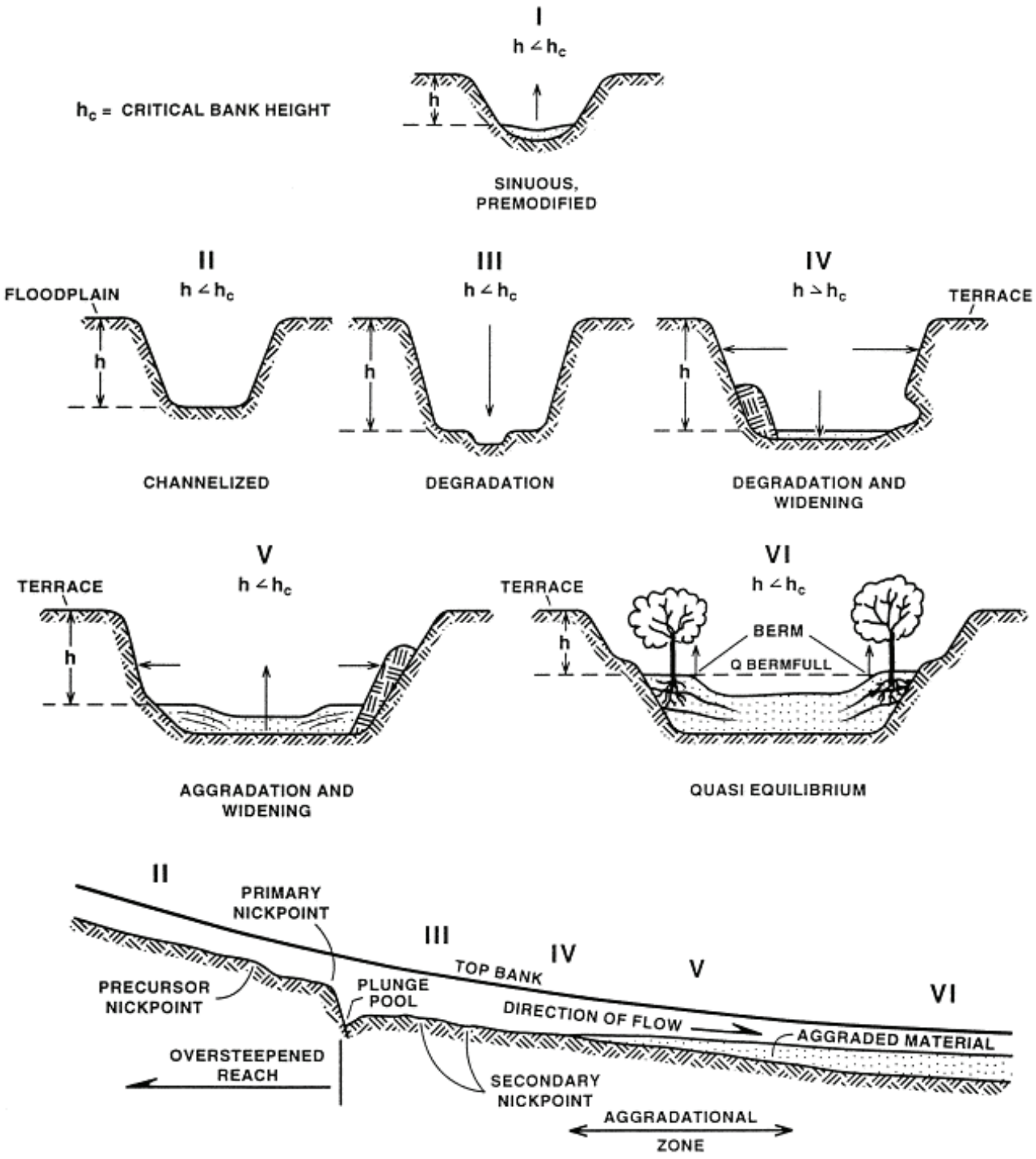
Natural alcoves are low terraces, benches, or backwater zones that are cut-off from the high velocity areas of the channel. During high flow events, fish seek the safety provided by alcoves which often include structurally complex large wood and inundated riparian vegetation features. CLSI's evaluation of fish habitats in the project area indicated a shortage of natural alcoves or high flow refugia. Existing side channels and alcoves have been filled in, disconnected by levees, or detached from the main channel.

The Proposed Project would integrate alcoves with berm and bank set-backs to maximize high-flow refugia and off channel habitat. Alcoves would be graded as topographic depressions immediately adjacent to the channel. Project alcoves will be designed to be inundated every 1.5 years (on average). The alcoves then drain back into the main channel as flows subside. **Figure 2-4** provides an example alcove layout along the project reach. Alcoves would be installed in conjunction with instream features, such as woody debris structures and willow baffles to provide added structural habitat complexity and velocity refugia.

2.3.2 Floodplain Restoration

Floodplain restoration aims to increase the frequency of the Napa River inundating its adjacent floodplain areas and thereby enhancing wetland and riparian habitat for migratory birds, amphibians, reptiles, and other terrestrial organisms.

Floodplain restoration includes mass grading and lowering of stream banks to elevations associated with specific flood events. Compared to the widening elements described above, floodplain restoration may involve a larger amount of grading, off-haul, permanent loss of productive agricultural land, and greater potential impacts to existing vegetation and cultural resources. Because floodplain restoration efforts typically involve larger contiguous areas of grading, a larger revegetation effort is also associated with this design element. Sites that involve substantial lowering would be cleared of existing vineyards and riparian vegetation. Substantial trees (>16" DBH) within one to 2 feet of proposed grades, including



Source: Schumm. 1984.

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Figure 2-3
Conceptual Channel Incision and Widening Process

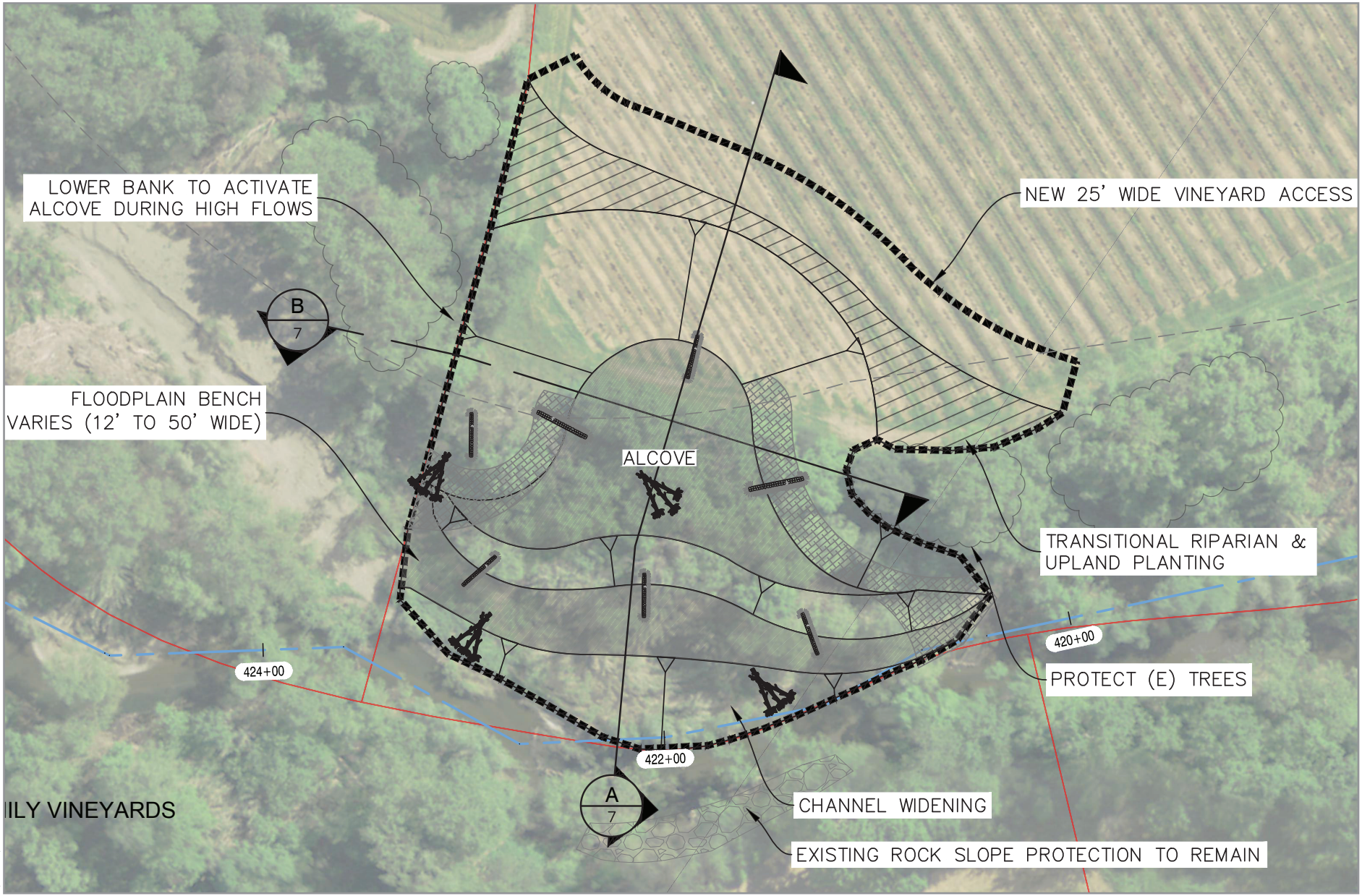


Figure 2-4
Conceptual Alcove Design

areas immediately adjacent to the existing channel will be protected to the extent feasible. All actively graded areas will be revegetated with a suite of native plantings appropriate for the specific hydrologic environment.

Ideal locations for floodplain restoration are where there are existing active secondary channels parallel to the mainstem or where landowners have dedicated large swaths of land adjacent to the main channel. The land between the main and secondary channels or adjacent vineyards would be graded such that the entire area would be more frequently inundated. Productive agricultural land in this area would be permanently lost and converted to riparian, wetland, and upland habitat. Where the active floodplain restoration abuts vineyards and agricultural facilities, a small berm would be constructed to maintain the existing level of flood protection. Existing secondary channels and topographic depressions will be integrated with floodplain restoration design to provide additional off-channel habitat and connectivity. The secondary channels will be designed to activate during annual to biennial flows and connect to the mainstem at their upstream and downstream ends. Large wood structures, willow baffles, and biotechnical stabilization measures would be incorporated into floodplain restoration actions.

The anticipated benefits of floodplain restoration are similar to channel widening. Floodplain restoration results in a larger channel area which will increase gravel deposition and riffle pool habitat in the main channel. Floodplain restoration will also provide off-channel refugia for salmonids during high flow events. Portions of the restored floodplains will be graded to hold water after storm events and would provide depressional wetland habitat for migratory birds, amphibians, reptiles, and other terrestrial organisms.

2.3.3 Biotechnical Stabilization

One of the principal objectives of the project is to reduce or ameliorate ongoing bank erosion processes, property loss, and subsequent sediment loading along the Napa River. Traditional stabilization approaches for minimizing erosion include installation of rock rip-rap, vertical walls, gabions, and other hard structures that provide minimal aquatic habitat value. Biotechnical stabilization utilizes a combination of rock & biodegradable materials to provide short term structural integrity to resist erosive forces while a matrix of vegetation that provides erosion resistance and habitat becomes established over the longer-term. Biotechnical stabilization measures include planted rock slope protection, coir rolls and erosion control blankets, willow baffles, willow brush mattresses, willow walls, vegetated soil lifts, and planting of native poles (alder, willow, etc.). The biotechnical bank stabilization elements will directly address TMDL requirements to stabilize eroding banks and reduce sediment inputs to the Napa River.

Where necessary, the Proposed Project would include the integration of biotechnical stabilization measures with all channel widening and floodplain restoration elements described above. To the extent possible, existing vegetation will be preserved and incorporated with biotechnical measures to minimize overall habitat and soil disturbance. Where channel widening and floodplain restoration activities are proposed, vegetation will be preserved at the toe of existing channel banks to promote sediment retention and preserve existing trees that provide important canopy cover. Willow & alder baffles would be constructed perpendicular to the dominant channel flow direction on floodplains, within alcoves, and where banks are set back to slow the velocity and lower the erosion potential

of flood waters. Where channel margins are void of existing vegetation and susceptible to erosion, a combination of native pole plantings, coir rolls, willow trenches, and other biodegradable features will be installed. Brush matting will selectively be installed on the upper slopes of flood benches and alcoves where more erosive flows are expected (e.g. at the up- and downstream transitions).

Where channel widening is infeasible, actively eroding banks may be stabilized using biotechnical methods such as brush matting or pole planting on slopes up to 1.5:1. There may be limited locations along the Project reach where more structural treatments (planted rock) are warranted based on shear stress stability analysis (e.g., Fischenich, 2001 or similar) and elevated risk to adjoining infrastructure (bridges, water intakes, etc.). Rock slope protection elements would incorporate pole planting, soil placement, and seeding to reduce impacts and maximize the habitat value of rock structures. Where feasible, existing rock slope protection will be removed and replaced with a flatter more stable slope covered with brush mattresses, erosion control fabric, and native plantings. In certain limited areas existing rock slope protection may be left in place at the toe of the channel bank to avoid destabilization.

At streambank locations where the projected shear stress is less severe, slopes will be covered with biodegradable erosion control fabric, seeded with native grass mix, and planted with a suite of native riparian and upland species. Native grass seeds and erosion control fabric will limit soil loss in the near-term as the native woody and groundcover species become permanently established. An irrigation system would be installed at each site and operated for three years to ensure successful plant establishment.

2.3.4 Instream Habitat Complexity Features

The Proposed Project would include installing instream features that provide immediate habitat improvements and initiate geomorphic processes responsible for long-term habitat sustainability. Each instream habitat feature has a specific purpose, target species, and target habitat life stage as summarized in **Table 2-4** and text below.

Table 2-4. Habitat Restoration Objectives for Proposed Instream Features.

Proposed Instream Feature	Restoration Objective	Species	Life Stage
Large Wood Structure	Increase Channel Habitat Complexity [1] Improve Localized Salmonid Rearing Habitat [2] Improve Freshwater Shrimp Habitat [2]	O. *mykiss* O. *tshawytscha* S. *pacifica*	Migration Spawning Rearing
Large Wood Structure Complex	Increase Channel Habitat Complexity [1] Improve Localized Salmonid Rearing Habitat [2] Improve Freshwater Shrimp Habitat [1]	O. *mykiss* O. *tshawytscha* S. *pacifica*	Migration Spawning Rearing
Grade Control Structures	Improve Fish Passage Arrest Channel Incision & Stabilize Channel	O. *mykiss* O. *tshawytscha*	Migration
Gravel Augmentation	Improve Spawning & Rearing Habitat [1] Improve Macro-invertebrate Production [2]	O. *mykiss* O. *tshawytscha*	Spawning Rearing
Roughness Boulders	Increase Channel Habitat Complexity [1] Improve Spawning & Rearing Habitat [2] Improve Macro-invertebrate Production [2]	O. *mykiss* O. *tshawytscha*	Migration Spawning Rearing

[1] Primary Design Objective
[2] Secondary/Ancillary Design Objective. The feature may provide habitat when combined with vegetated soil lifts or near-stream revegetation.

Large Wood Structures & Large Wood Structure Complexes

An abundant supply of large wood is an integral part of aquatic ecosystems as it influences the morphology, function, and formation of habitat. Channel complexity can be defined as the degree of variability or range of flow depths and velocities encountered along a channel. Complex channels exhibit highly variable topography associated with zones of constrictions (pools) and expansions (riffles) and support a wider diversity of habitats for aquatic organisms. Large wood influences the spatial pattern of scour and deposition to create a diversity of depths and velocities that support a wider range of aquatic habitats. Along the Napa River juvenile salmonids and freshwater shrimp utilize woody debris features (inundated roots, submerged vegetation, and stems) to feed, avoid predators, and maximize growth.

The Proposed Project would install large wood structures to initiate scour, deposition, and sediment segregation to sustain long-term channel complexity. A secondary objective of large wood structures is to increase near-term habitat for juvenile salmonids and California freshwater shrimp (CFS). The proposed large wood structures would provide immediate increases in available complex habitat for salmonids. Large wood structures would also be integrated with vegetated soils lifts and adjacent riparian plantings to establish submerged, trailing vegetation and roots to create and enhance habitat for CFS. The project would include winter and summer CFS habitat features at various locations throughout the Project, potentially including Sites 13, 14, and 23. Winter habitat features would re-establish undercut banks that provide the substrate (i.e., exposed roots) and low-velocity refugia required by CFS. Potential summer habitat features would involve creating areas with submerged vegetation along channel margins and in low velocity regions to provide suitable conditions for CFS foraging habitat. Additionally, the proposed bank setback and channel widening throughout the entire Project reach would elicit wider average channel widths and provide greater opportunity for aquatic vegetation establishment along channel margins compared to the poor existing conditions with steep banks and narrow margin of vegetation. CFS habitat features would be constructed out of a combination of biotechnical elements and large wood, and designed with input from federal and state agencies.

An example winter habitat feature may include vegetated soil wraps that are cantilevered over relatively mobile substrates on outside meander bends where flow can scour beneath the supporting logs. The soil wraps would be staked with pole cuttings. Over time, the substrate beneath the vegetated soil wraps would be scoured away and the developed undercut would expose complex root matrices and interstitial habitat, which would be available for winter use by CFS.

Log structures would be installed along channel margins, on flood benches, and along channel banks. Each log structure will consist of several (2 to 3) pieces of large woody debris (trunks with intact rootwads) and smaller branches wedged between stable trunk members. Keystone wood pieces will be buried in the channel bank and flood benches and ballasted with rock. Live pole plantings will be installed within log structures for future recruitment of woody debris and to provide shade and complex submerged root structure along channel margins.

Large wood structure complexes consist of groupings of multiple (2 to 4) large wood structures that will be strategically placed along the channel to initiate scour and deposition patterns. The larger multiple wood complexes create more expansive flow constrictions to scour and maintain pool features, compared to singular large wood structures. As flows expand downstream of the large wood structures, channel velocity will decrease and deposit coarse sediment to form riffles. This undulating pattern of high and low velocity regions will create and maintain riffle-pool morphology and overall channel complexity to benefit adult and juvenile salmonids.

Grade Control Structures

Land use changes in the Napa River watershed have increased run-off and dam construction has reduced sediment supply. The combined effect of increases in peak run-off, reductions in coarse sediment supply, and channel confinement have resulted in channel incision and simplified morphology along the Napa River. Signs of channel incision are evident throughout the Project reach and include 20- to 30-foot tall vertical banks, abrupt steps in the channel profile that may limit fish passage, and long sections of deep slow glides that provide limited channel habitat complexity. Incision will continue until stream processes adjust to watershed inputs of water and sediment or the Napa River encounters grade control features (resistant clay layers, bedrock, bridge aprons) that stop the vertical movement of the channel.

The Proposed Project would install up to four grade control structures at specific locations to rebuild and stabilize the vertical profile of the channel. Rebuilding and stabilizing the channel will improve fish passage conditions by reducing the height of existing barriers and steps that adult and juvenile salmonids must negotiate when migrating and foraging. The grade control structures would provide consistent access to high quality spawning and rearing habitat further upstream. Installation of grade control features will also provide distinct points in the channel profile that dissipate hydraulic energy and create pool features. As water flows over each grade control structure, energy is transferred to the channel bed, scours the substrate, and helps create and maintain pool habitat immediately downstream.

Grade control structures would be constructed of three interlocking layers of boulders vertically and laterally keyed (buried) into the streambed. The structures would span the active channel and floodplains, and tie into existing channel banks to avoid flanking. Rocks

composing each structure would be sized to be immobile and therefore function as discrete bands of resistant material in the channel profile; mimicking existing erosion resistant clay layers observed throughout the Project Reach. These features would be designed to promote fish passage, would establish stable points in the channel profile, promote sediment deposition upstream, and form scour pools immediately downstream.

Gravel Augmentation

In natural unimpaired systems coarse sediment is generated in the upper watershed and transported through stream and river networks. In the Napa Watershed, tributary reservoirs such as Lake Hennessey and Rector Reservoir trap coarse sediment and reduce the amount of coarse sediment available for spawning, macro-invertebrate production, and juvenile rearing along the Napa River. Gravel augmentation is a restoration action that offsets the impact of dams by adding coarse sediment that meets the specific size requirements of spawning and rearing salmonids.

The Proposed Project would include up to 5,000 cubic yards of gravel augmentation at Sites 13 and 14 to provide interim habitat for spawning and rearing salmonids. Augmented gravels will be used to raise the existing channel bed between grade control structures at Sites 13 and 14. Gravels would be spread and contoured with a front end loader to create riffle and pool features that correspond to areas of flow expansion and contraction, respectively. Placed gravels will provide an immediate increase in the amount of available spawning and rearing habitat before flows capable depositing coarse gravels within each project site occur.

The proposed gravel augmentation elements are discrete one-time actions. Repeat or continued gravel augmentation efforts at each site are not anticipated. Channel widening and bank setbacks will decrease overall shear stress in the channel and will capture and retain coarse sediment already moving through the system. As with all Project sites, the Napa County RCD will provide post-project monitoring to document channel response.

Clean and washed gravels will be sourced from either adjacent alluvial fan tributaries where ongoing channel maintenance activities generate surplus sediment or from quarries nearby. Gravel would be sifted, cleaned, and sorted to size classes specifically utilized by Chinook salmon and steelhead trout. Gravel would be added directly to the channel or in close proximity and then graded to the final design configuration with loaders and excavators. Gravel augmentation activities will be conducted in concert with mass grading and channel widening and will require a dewatered construction environment.

Roughness Boulders

The Proposed Project includes the installation of roughness boulders to create habitat variation, provide moderate flow refuge, and encourage substrate sorting and pool development at lower base-flow conditions (spring and fall). Roughness boulders are groupings of five to ten 2- to 4- ton rocks that are placed in the low-flow region of the channel. They break up uniform channel morphology and hydraulic conditions by creating localized areas of high velocity along boulder margins and velocity breaks immediately upstream and downstream. During lower base-flows the boulder margins provide localized pool features. Deposition of coarse gravels upstream and downstream of the boulders creates topographic highs or riffles that are critical macro-invertebrate production sites.

The increased diversity of channel velocities and bed topography provides immediate structural salmonid and macroinvertebrate habitat improvements.

Roughness boulders would have a lasting functional impact on channel morphology. During large flow events (>Q_5) when coarse gravels are being transported through a site, the relatively immobile roughness boulders promote the sorting, deposition, and retention of gravels critical for spawning and macro-invertebrate production. Roughness boulders will trap coarse gravel during higher discharges and set the stage for the formation of riffle and pool features described above. Therefore roughness boulders provide both structural improvements in habitat (velocity diversity) and a functional process improvement (gravel retention and pool formation) that lead to overall greater aquatic habitat complexity.

Unlike channel spanning grade control structures or gravel augmentation, roughness boulders can be installed without dewatering the channel and with limited impact to the existing channel structure. Boulder clusters would be surgically placed with excavators near expansions in flow area or where gravel recruitment is desired. Each roughness boulder element may contain up to ten boulders placed to interact with one another during high and low flow events. To the extent practicable roughness boulders would be repurposed from existing levee and streambank protection facilities.

2.3.5 Managed Streambank Retreat

Throughout the Project reach a managed streambank retreat corridor has been defined. The active restoration elements described above will not be implemented within the managed retreat corridor, but a more passive longer-term restoration approach would be followed. More specifically, at some Project sites existing and on-going streambank erosion would be allowed to let the channel arrive to its wider equilibrium cross section over time. In this scenario, landowners would voluntarily establish a zone or riparian buffer where natural flow and flooding processes could occur. Within the managed streambank retreat zone, natural bank failure and concomitant channel expansion would be tolerated as long as it does not threaten adjacent facilities or create unstable banks that extend outside the designated managed streambank retreat corridor. The District will monitor the managed streambank retreat corridor annually and work with landowners to inspect sites upon request to determine when, where, and what maintenance actions are required. As needed, treatment of the channel banks or riparian corridor would be implemented by the County as part of the Maintenance Assessment District (described below). In the event that a site experiences large scale retreat or erosion the District may choose to collaborate with the landowner to identify a solution as part of a stream bank stabilization cost share program, which would require the landowner to design, permit, and construct a biotechnical bank stabilization project.

The rationale for managed streambank retreat is based on the high cost of restoring the entire 9-mile project reach, observations of morphologic and habitat complexity along the Napa River, and anticipated channel adjustments. Managed streambank retreat will establish a boundary in the landscape that demarcates a bank width to height ratio of 10:1; a functional corridor width dedicated to supporting long-term habitat sustainability and system resiliency. As a design solution, managed streambank retreat establishes a functional corridor width (riparian buffer) and then relies on anticipated channel widening processes to complete the work.

Managed streambank retreat is proposed along the entire project reach but would only be implemented by participating landowners who agree to scale back their operations near the river corridor. Landowners would voluntarily remove access roads, vineyards, and vineyard facilities (including irrigation appurtenances) to establish the managed streambank retreat zone discussed above. Managed streambank retreat would reduce the pressure of vineyard operations on the riparian corridor and avoid costly and unsustainable bank armoring practices that actually restrain the channel from following its geomorphic trajectory.

The implementation of managed streambank retreat will vary significantly by site. Landowners may opt to remove healthy or diseased vineyards in the first year of the project or may continue farming until channel widening processes reclaim the vineyard. In other instances, vineyards may remain in the managed streambank retreat zone until their productivity wanes or may be replaced with vineyards or other agricultural plantings. A hypothetical managed retreat process is illustrated in **Figure 2-5** which starts with a deeply entrenched channel with near vertical banks and large undercut "spider trees" perched atop the bank. The first phase of managed streambank retreat would include vineyard removal, back-planting with upland trees and grass species, and grading of a new setback access road at the corridor edge. The existing riparian corridor would be cleared of non-natives (vegetation management) and replanted with a suite of native pioneer species. As the upland plantings and oak woodland becomes established the channel would be allowed to widen and reclaim portions of the bank and associated woody structures. The future condition represents the fully developed managed streambank retreat zone with a widened channel cross section that sustains complex geomorphic features (riffles, pools, lateral bars), an upland forest over-story, and series of naturally formed inset benches that activate at various flow events. Although the phasing of managed streambank retreat implementation will vary along the Project Reach the action will result in a more expansive riparian corridor for terrestrial species and wider channel cross section that supports long-term habitat sustainability.

2.3.6 Vegetation Management

The Napa River project reach contains an assemblage of non-native species that reduce riparian habitat complexity, disrupt habitat-forming physical processes, and threaten vineyard health by providing refuge for the blue-green sharpshooter (*Graphocephala atropunctata*). For example, Vinca (*Catharanthus spp.)* and Himalayan Blackberry (*Rubus armeniacus*) impede native vegetation establishment and are known hosts for the blue-green sharpshooter. Arundo (*Arundo donax*) out-competes native understory species, confines the channel, and causes localized bank scour.

Vegetation management would include the removal of nonnative and exotic species and select removal of native blue-green sharpshooter hosts throughout each site. Vegetation management would be conducted as part of clearing and grubbing activities and would be completed before grading commences. **Table 2-5** provides a list of plant species that would be removed where vegetation management is prescribed. Following treatment, these areas will be planted with a native overstory and understory appropriate for local conditions (see Site Revegetation).

Table 2-5. Nonnative and Exotic Plant Species to be Removed

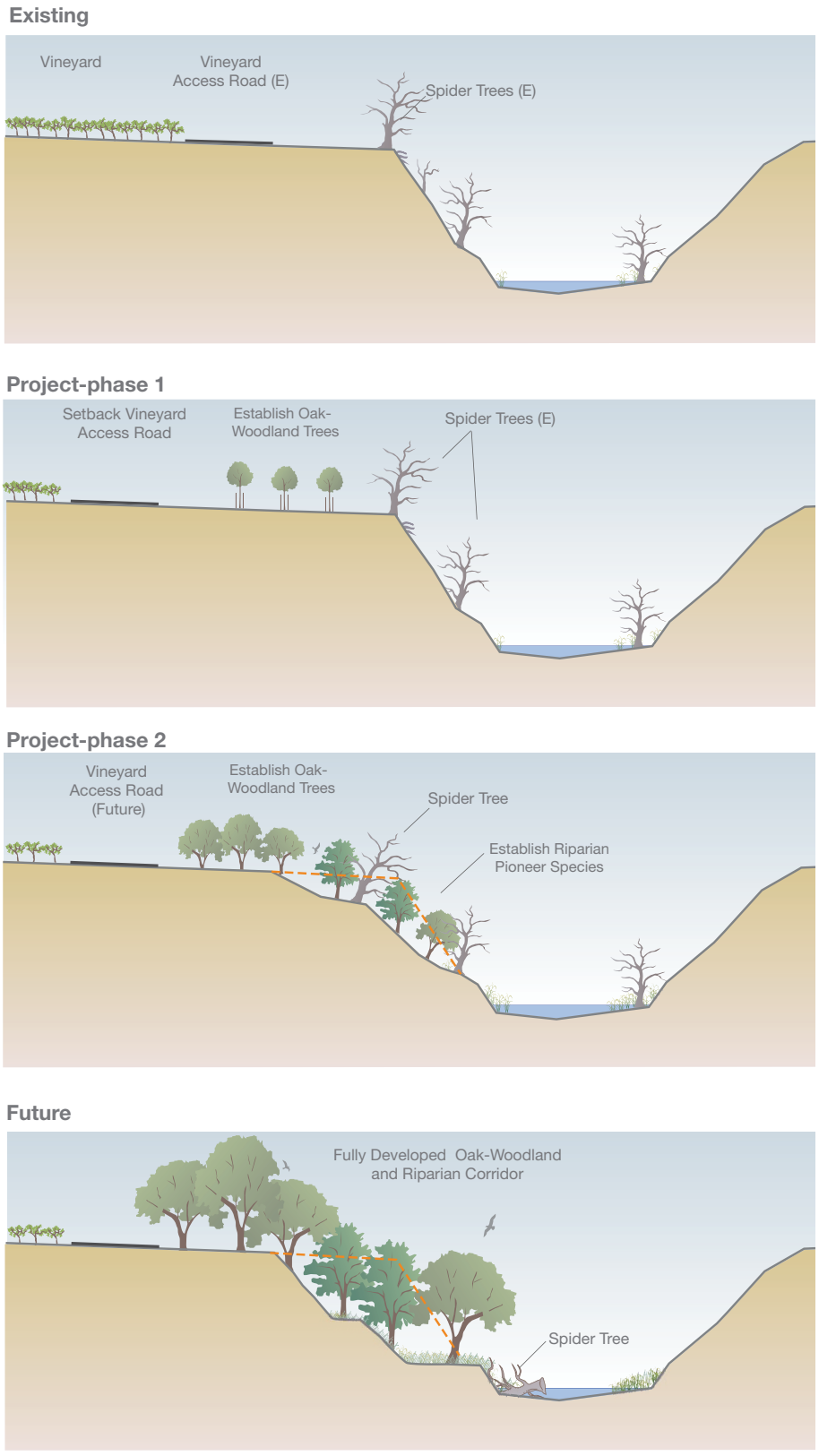
Common Name	Scientific Name
Himalayan blackberry	*Rubus discolor*
Periwinkle	*Vinca major*
Giant reed	*Arundo donax*
Tree of heaven	*Alianthus altissima*
Sesbania	*Sesbania punicea*
Wild grape (hybrid)	*Vitis spp.*
Mulefat	*Baccharis salicifolia*

Vegetation management is prescribed on approximately 18 acres and would be implemented using hand tools including shovels, rakes, and chainsaws to minimize disturbance to existing resources. Mechanized equipment, track mounted bobcats, and mini-excavators will be used on a limited basis to eliminate extensive Arundo stands and blackberry thickets. Herbicides approved for use in sensitive riparian/aquatic environments would be applied to Arundo root masses for 2 years following mechanized treatment but would be coordinated with ongoing vineyard practices. Removed vegetation that cannot be reused onsite would be chipped and either used by landowners or taken to the Napa Recycling and Waste Service Center for use and resale by their composting program. Continued vegetation management including non-native and blue-green sharpshooter host removal would be conducted under the Project Maintenance Program activities described below.

2.3.7 Site Revegetation

The Proposed Project includes approximately 84 acres of native vegetation to restore and enhance the existing riparian corridor. Revegetation of both under and overstory species appropriate for the restored area and target habitat type would be conducted in all graded and disturbed areas. Reference sites within the project reach or within close proximity will be used to identify a successional trajectory to inform revegetation planning. For example, new floodplains, benches, and widened channel banks would be planted with native species specifically adapted to the sites soil type and expected hydrologic regime. Revegetation planning and native plant selection will focus on mimicking the naturally occurring plant communities found at the reference sites. The planting plan will include a high density of pioneer species designed to quickly establish canopy cover. **Table 2-6** provides a planting list broken down by planting zone (elevation above active low-flow channel). When fully established, plantings will reduce flow velocities, increase bank stability, provide new sources of large woody debris, create high-flow refugia for native fish, and enhance habitat for other species that utilize the riparian corridor. In addition, as the plantings mature, vegetation adjacent to the stream channel may develop the trailing root structures and submerged foliage CFS favor as summer habitat.

Plant materials would include live locally-harvested cuttings and several sizes of container stock to maximize ultimate survivorship and development of healthy root systems. All materials would be locally sourced and native to the Napa River corridor. Some propagules may be salvaged from on-site grading activities that require removal of native vegetation for channel widening. If necessary, additional container stock would be obtained from certified native plant nurseries nearby.



Source: ESAPWA 2013.

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Figure 2-5
Conceptual Managed Retreat Process

Typical planting densities will range from 300 to 350 plants per acre and species would be planted in the successional stages that would naturally be established. Microsites will be identified within each restoration area based on elevations and proximity to the stream. Within each microsite or zone a high density of pioneer species adapt to specific environmental conditions will be installed. For example, heat-tolerant species would be planted first, as appropriate, to ensure the highest level of successful establishment. The objective is to quickly establish canopy cover and an ecologically self-sustaining mosaic of habitats. Revegetation sites will be monitored and later successional species will be integrated to ensure complex and diverse riparian plant community is established over time, which is similar to the species composition identified at reference sites. Planting activities would take place in the fall, permitting some establishment of new plantings before the onset of high temperatures and drier conditions in late spring and summer. Site preparation and planting would rely on hand techniques. Irrigation would be installed to support top of bank plantings during the first few years following restoration. The lower planting zones would be watered by hand.

Table 2-6. Typical Native Plant Species to be Planted

Planting Zone and Plant Type	Biological Name	Common Name
Buffer Area Habitats (Outside Limits of Grading)		
River Wet Edge		
Herbaceous	*Carex barbarae*	Santa Barbara Sedge
	Carex praegracilis	California Field Sedge
	Juncus balticus	Baltic Rush
	Juncus effusus var. brunneus	Common Rush
Upland Oak Woodland		
Trees	*Aesculus californica*	California Buckeye
	Juglans californica var. hindsii	California Black Walnut
	Quercus agrifolia	Coast Live Oak
	Quercus kelloggii	Black Oak
	Quercus lobata	Valley Oak
Shrubs	*Achillea millefolium*	Yarrow
	Baccharis pilularis	Coyote Bush
	Heteromeles arbutifolia	Toyon
	Sambucus mexicana	Elderberry
	Ribes californicum	California gooseberry
	Rosa californica	California Wild Rose
Graded Area Habitats (Within Limits of Grading)		
Lower Floodplain Bench		
Trees	*Alnus rhombifolia*	White Alder
	Fraxinus latifolia	Oregon Ash
	Populus fremontii	Fremont's Cottonwood
	Salix laevigata	Red Willow
	Salix lasiolepis	Arroyo Willow
	Salix lutea	Yellow Willow
Shrubs	*Baccharis salicifolia*	Mule Fat
	Physocarpus capitatus	Ninebark

Planting Zone and Plant Type	Biological Name	Common Name
	Rosa californica	California Wild Rose
	Symphoricarpos albus	Snowberry
Herbaceous	*Carex barbarae*	Santa Barbara Sedge
	Carex praegracilis	California Field Sedge
	Elymus triticoides	Creeping Wildrye
	Euthamia occidentalis	Western Goldenrod
	Juncus balticus	Baltic Rush
	Juncus effusus var. brunneus	Pacific Rush
Lower Floodplain Slope		
Trees	*Alnus rhombifolia*	White Alder
	Fraxinus latifolia	Oregon Ash
	Populus fremontii	Fremont's Cottonwood
	Salix laevigata	Red Willow
	Quercus agrifolia	Coast Live Oak
	Salix lasiolepis	Arroyo Willow
Shrubs	*Baccharis pilularis*	Coyote Bush
	Sambucus mexicana	Elderberry
	Physocarpus capitatus	Ninebark
	Rosa californica	California Wild Rose
	Symphoricarpos albus	Snowberry
Herbaceous	*Carex barbarae*	Santa Barbara Sedge
	Elymus triticoides	Creeping Wildrye
	Euthamia occidentalis	Western Goldenrod
	Juncus balticus	Baltic Rush
	Symphyotrichum chilense	Common Aster
Upper Floodplain Slope		
Trees	*Acer macrophyllum*	Big Leaf Maple
	Aesculus californica	California Buckeye
	Fraxinus latifolia	Oregon Ash
	Juglans californica var. hindsii	California Black Walnut
	Populus fremontii	Fremont's Cottonwood
	Salix laevigata	Red Willow
	Quercus lobata	Valley Oak
	Quercus agrifolia	Coast Live Oak
	Umbellularia californica	Bay Laurel
Shrubs	*Baccharis pilularis*	Coyote Bush
	Calycanthus occidentalis	Western Spice Bush
	Heteromeles arbutifolia	Toyon
	Physocarpus capitatus	Ninebark
	Ribes californicum	California gooseberry
	Rosa californica	California Wild Rose
	Sambucus mexicana	Elderberry
	Symphoricarpos albus	Snowberry

Planting Zone and Plant Type	Biological Name	Common Name
Vines	*Aristolochia californica*	Pipe vine
	Lonicera hispidula	Honeysuckle
Herbaceous	*Carex barbarae*	Santa Barbara Sedge
	Elymus glaucus	Blue Wildrye
	Elymus triticoides	Creeping Wildrye
	Festuca idahoensis	Idaho Fescue
	Muhlenbergia rigens	Deergrass
	Symphyotrichum chilense	Common Aster
Upper Bank Slope		
Trees	*Acer macrophyllum*	Big Leaf Maple
	Aesculus californica	California Buckeye
	Juglans californica var. hindsii	California Black Walnut
	Quercus agrifolia	Coast Live Oak
	Quercus lobata	Valley Oak
Shrubs	*Achillea millefolium*	Yarrow
	Baccharis pilularis	Coyote Bush
	Sambucus mexicana	Elderberry
	Heteromeles arbutifolia	Toyon
	Ribes californicum	California gooseberry
	Rosa californica	California Wild Rose
Herbaceous	*Bromus carinatus*	California Brome
	Carex barbarae	Santa Barbara Sedge
	Elymus glaucus	Blue Wildrye

2.4 Project Area and Restoration Sites

The Concept Plan organized the restoration approach according to river reaches and sites. The Proposed Project is comprised of twenty-three sites along the approximately 9 mile project reach. **Table 2-7** lists the existing conditions and proposed restoration elements for each of the restoration sites, listed from upstream (north) to downstream (south).

Table 2-7: Summary of Existing Conditions and Proposed Restoration Actions by Site

Project Site	Project Footprint (Acres)	Restored Area (Acres)	Existing Conditions / Project Need	Proposed Restoration Elements*
23	1.4	1.3	Limited off-channel habitat, extensive arundo, rock slope protection	CW, BS, IH, VM, SR
22	2.9	2.7	Extensive arundo, disconnected high-flow channel, established cottonwood and willows on flood bench	FR, BS, IH, CM, SR
21	1.6	1.2	Eroding channel bank, minimal in-stream refugia	CW, BS, IH, VM, SR
20	4.2	4.0	Highly entrenched, established eiparian corridor	CW, BS, VM, SR
19	3.2	2.9	Highly entrenched, established riparian rorridor	FR, BS, IH, VM, SR
18	0.6	0.5	Highly entrenched, established riparian corridor	CW, BS, VM, SR
17	1.4	1.4	Existing residence on inside bend terrace	CW, FR, BS, IH, VM, SR
16	01.7	1.6	Established riparian corridor, concrete slope protection, overhanging in-channel habitat	BS, VM, SR
15	13.7	4.8	Vineyard and vineyard road to be relocated and riparian corridor established over time	MR
14	16.9	11.8	Actively eroding banks, existing flood control berm, dominated by glide habitat, discrete stands of large trees (oaks, bays, walnuts)	CW, FR, BS, IH, VM, SR
13	13.4	12.4	Island vineyard between Napa river and side channel, limited flood terrace and floodplain connection	CW, FR, BS, IH, VM, SR
12	2.4	2.1	Entrenched & confined channel, limited floodplain connection, discrete stands of large trees	CW, BS, IH, VM, SR
11	2.6	2.6	Existing flood detention pond, established riparian over and understory	FR, VM, SR
10	4.5	4.5	Existing setback berm and high flow swale, intermittent stands of large trees, channel contains active gravel bars and sediment deposition associated with channel vegetation	FR, CW, BS, IH, VM, SR
9	3.9	3.9	Upstream – Fallow field between floodplain berm and river channel. Includes recently planted native riparian trees established by the landowner Downstream – Narrow band of established trees at top of bank that overhang a severely entrenched channel with limited complex habitat & refugia	CW, FR, BS, IH, VM, SR
8	0.6	0.6	Narrow band of established trees at top of bank that overhang a severely entrenched channel with limited complex habitat & refugia	CW, FR, BS, IH, VM, SR

Project Site	Project Footprint (Acres)	Restored Area (Acres)	Existing Conditions / Project Need	Proposed Restoration Elements*
7	1.3	1.0	Vineyard irrigation pond and access road, narrow band of established trees along top of overly steepened and armored channel bank, limited floodplain connection	CW, BS, VM, SR
6	6.2	6.2	Highly entrenched, limited riffle pool habitat, unplanted (fallow) field adjacent to site, intermittent stands of large trees along top of overly steepened bank. limited floodplain connection	FR, CW, BS, IH, VM, SR
5	11.9	10.9	Highly entrenched, limited riffle pool habitat, unplanted (fallow) field adjacent to site, intermittent stands of large trees along top of overly steepened bank, limited floodplain connection	FR, CW, BS, IH, VM, SR
4	4.3	4.1	Existing wetland complex disconnected from Napa river	FR, VM, SR
3	5.3	5.3	Fallow (unplanted) field along bypass channel, banks exhibit intermittent stands of large trees, Limited connection between floodplain and Napa river	FR, CW, BS, IH, VM, SR
2	2.0	1.6	Highly entrenched, active Chinook spawning site, gravel recruitment limited	CW, BS, IH, VM, SR
1	2.1	1.5	Highly entrenched, active Chinook spawning site, gravel recruitment limited	CW, BS, IH, VM, SR

* CW-Channel Widening, FR-Floodplain Restoration, BS-Biotechnical Stabilization, IH-Instream Habitat, MR-Managed Retreat, VM-Vegetation Management, SR-Site Revegetation

Table 2-8 below summarizes the areal impact to riparian habitat to implement the Proposed Project and how that compares to the area of restored habitat by the Proposed Project. While the anticipated impacts to existing riparian areas are considered short-term, the restoration activities of the Proposed Project are estimated to provide both shorter-term and longer-term benefit. In terms of area, the restored area of the Proposed Project includes 108 acres compared to the shorter-term impacted existing riparian area of 55 acres. A total of 36 acres of plantable vineyard area will be removed with the Proposed Project.

Table 2-8: Summary of Impacts and Restoration Areas by Site

Project Site	**Project Footprint** (Acres)	**Impact to Habitat** (Acres)	**Restored Area** (Acres)	**Acres of Vineyard Loss** (Net)
23	1.4	0.8	1.3	0.5
22	2.9	1.7	2.7	0.9
21	1.6	0.8	1.2	0.4
20	4.2	2.7	4.0	1.3
19	3.2	1.5	2.9	1.6
18	0.6	0.3	0.5	0.2
17	1.4	0.9	1.4	0
16	1.7	1.4	1.6	0.1
15	13.7	6.2	0.0	6.9
14	16.9	4.2	11.8	5.1
13	13.4	6.0	12.4	5.1
12	2.4	1.0	2.1	1.2
11	2.5	2.2	2.6	0
10	4.5	4.7	4.5	0
9	3.9	3.1	3.9	0
8	0.6	0.6	0.6	0.15
7	1.3	0.3	1.0	0.1
6	6.2	5.1	6.2	2.9
5	12.0	2.6	10.9	7.3
4	4.3	2.4	4.1	0.9
3	5.3	5.0	5.3	0
2	2.0	0.6	1.6	0.9
1	2.1	0.8	1.5	0.9
Total	**108**	**55**	**84**	**36**

Appendix A includes the preliminary (30% complete) designs for the proposed restoration sites. The anticipated restoration actions proposed for each site are described below. General locations of each restoration site are shown on Figures 2-2a and 2-2b.

Restoration Site 23

Restoration Site 23 is on the inside of a river bend, adjacent to a wide area of the channel.

Channel widening. An overbank flood bench or alcove will be graded on the left bank from Station 420+00 to 424+00. The alcove will be designed in a manner that ensures the meander bend at this location will not take a shorter and straighter course and will provide alcove like backwater habitat. The target frequency of activation will be Q1.5 or lower.

Add large wood. Large wood will be selectively placed at the site to enhance sediment sorting, provide bank protection and improve high flow refugia habitat.

Restoration Sites 21 and 22

Restoration Site 21 is an actively eroding bank on the outside of a meander bend. Restoration Site 22 is opposite of Site 21 and is located on the inside bend of the channel. Site 21 consists of 20 to 25 foot tall nearly vertical channel banks with and extensive but narrow band of trees along the top of bank. Most of the trees have been severely undermined and will fall into the river without action.

Channel widening. The right bank will be stabilized from Station 400+00 to Station 407+00 by laying the bank back at side slope between 3:1 and 4:1.

Floodplain restoration. An overbank floodplain bench and secondary channel would be graded through Site 22. The design would expand on an existing high flow channel to create a larger seasonally inundated floodplain and channel network at the site. The existing flood berm would be set back to support floodplain restoration activities and would be rebuilt to maintain current flood level protection. Within the floodplain, existing old growth cottonwoods and significant trees would be preserved as tree island features. The floodplain bench and secondary channel network will be designed to activate during a 1.5-year (or larger) event.

Add large wood and boulders. Large wood structures will be placed to influence channel morphology and provide immediate complex habitat for salmonids. Large wood structures would line the edge of Site 21 and provide energy dissipation along the channel toe. These structures will provide habitat for both salmonids and freshwater shrimp. Large wood structures would also create a diversity of hydraulic conditions within the floodplain and channel margins that promote gravel recruitment and maintenance of riffle pool morphology. Roughness boulders will be placed throughout the main stem channel and along margins to enhance sediment accumulation at riffles and alternating bars.

Restoration Sites 20 - 15

Sites 20 through 15 include five distinct sites along the east and west banks of the Napa River.

Channel widening. For Restoration Sites Site 20 though Site 16 channel widening will be performed to maximize channel width to depth ratios. The extent of widening activities will

be determined by landowner constraints and input but will provide reductions in channel bed shear and increases in gravel recruitment at each site. Channel widening activities will maximize tree preservation by incorporating large trees as tree island features.

Add large wood and boulders. Large wood structures will be placed to influence channel morphology and provide immediate complex habitat for salmonids. Large wood structures will create a diversity of hydraulic conditions that promote gravel recruitment and maintenance of riffle pool morphology. Roughness boulders will be placed throughout the channel and along margins to enhance sediment accumulation at riffles and alternating bars.

Managed Streambank Retreat. Actions associated with the managed streambank retreat zone between sites Site 20, Site 19, and Site 18 include:

- Vineyards would be set back to the new managed streambank retreat line depicted on the figures in Appendix A.
- A new access road and berm commensurate with the current level of flood projection would be constructed.
- Areas within the managed streambank retreat zone (but not within existing riparian habitat) would be lowered by a foot and replanted with either: 1) all native species or 2) replanted with either vineyards or some other agricultural crop. In scenario 2, the landowner may continue farming the area but would not make any repairs to the channel bank if erosion or bank failure events occur and are limited to the managed streambank retreat zone.
- The managed streambank retreat zone and adjacent existing riparian/upland areas would be treated for non-natives (vegetation management) and managed as part of the maintenance assessment district.

Restoration Sites 13 & 14

Restoration Site 13 includes the left bank of the Napa River which exhibits moderate bank erosion and a poorly connected floodplain. A second parallel channel marks the eastern edge of this site. The secondary channel is broad and shallow and vegetated with wetland and riparian plants.

Site 14 is opposite to Site 13 and includes the right bank of the Napa River and the adjacent vineyard. The bank is actively eroding and undermining a large flood control berm and existing old growth trees along the top of bank.

Sites 13 & 14 comprise one of the most incised reaches on the Napa River (at 3.8:1 the bank top width-to-depth ratio is almost half the mean value for the Oakville to Oak Knoll project). Incision has been partially arrested by rip rap under Yountville Road Bridge, creating an approximately 2 foot high step that is a partial barrier to fish passage. Although this reach has low quality spawning habitat and the glides support a large population of pike minnow (predatory to juvenile salmonids), this reach is overused by spawning Chinook Salmon (redd superposition) that may not be able to navigate the partial barrier during typical fall base-flow conditions.

Channel widening. Channel widening activities on Site 13 and 14 will be integrated. A series of alternating high and low floodplain benches will be graded on river left (Site 13) to provide variable stage inundation and width variation that promote riffle pool morphology. On the right bank (Site 14) the channel bank and existing berm will be set back to provide a stable cross-sectional profile while increasing flow area. Large existing trees will be preserved as tree-islands and point bar features to retain existing canopy coverage over the channel. Additional areas will be lowered to create floodplain benches that activate during larger hydrologic events (>5-year). Any channel sinuosity changes will be designed to incorporate and protect existing mature trees.

Floodplain restoration. From station 259+00 to 263+00 a series of depressions will be graded to provide wetland habitat in the floodplain. These areas will be designed to accumulate direct rainfall and receive overflow during run-off events. Secondary channels will be excavated to provide additional flow connectivity across the floodplain and provide off-channel refugia. The intended activation frequency for these secondary channels is the Q1.5 event (about every other year, or more frequent).

Gravel augmentation. Use blanket placement of spawning-size gravel in conjunction with grade control structures to raise the bed by up to 3 feet at Yountville Bridge. Gravel augmentation and grade control elements would eliminate the fish passage barrier at the site and provide substrate critical for juvenile rearing and adult spawning. Large wood structures and roughness boulders (see below) will be placed in the bed on either side at approximately 5-7 channel widths to trap gravel and encourage riffle-pool formation.

Add large wood and boulders. Large wood will be placed in the channel to enhance maintenance of pools at the outside of low flow channel meander bends. The pieces shall be anchored by burying the trunks in native stream banks and will be ballasted with rock. Low profile roughness boulders may also be used to enhance/maintain alternating bars opposite of the pools on the inside of the low flow channel bends.

Restoration Site 12

Restoration Site 12 encompasses approximately 500 feet of the left bank of the Napa River.

Channel widening. Channel banks will be widened and lowered to create a floodplain bench and tree-island complex that inundates during the 1.5-year event.

Add large wood and boulders. Large wood will be placed in the channel to enhance maintenance of pools at the outside of low flow channel meander bends. The pieces shall be anchored by burying the trunks in native stream banks and will be ballasted with rock. Low profile roughness boulders may also be used to enhance/maintain alternating bars opposite of the pools on the inside of the low flow channel bends.

Restoration Site 11

Restoration Site 11 is a stormwater water detention pond that is also used to temporarily store water for frost protection and irrigation. The pond is located within the floodplain and provides an excellent opportunity to increase river and floodplain connectivity. The stormwater pond receives direct run-off from a small watershed east of the project site that

includes vineyards and rural residential land uses. The pond is separated from the Napa River by a short short 5 to 6 foot tall berm.

Floodplain restoration. A wetland depression will be graded in the left overbank area by removing the western edge of the existing pond berm. Removal of the berm will reconnect the existing unused detention pond to the Napa River and capture run-off from an adjacent drainage ditch. The proposed feature will provide important off-channel wetland habitat for terrestrial and migratory species.

Restoration Sites 10

Restoration Site 10 includes a setback berm that was created in the 1960's to provide a buffer between the managed vineyard and Napa River. The western edge of the berm is lined with native oaks and walnuts to be preserved. The area between the existing berm and the river is dominated by young seedlings, ruderal grasses, and limited stands of large walnut and oaks.

Channel widening. Between station 169+00 and 175+00 the existing channel will be set back and integrated with an extensive flood plain bench and tree-island complex. The floodplain feature will become inundated at approximately a 1.5-yr event to provide off-channel refugia. The high degree of channel widening will help recruit coarse gravels and the express riffle-pool morphology at the site.

Restoration Site 9

Restoration Site 9 is located upstream of a significant channel bend next to an existing fruit orchard and is immediately downstream of Site 10. Channel banks at Site 9 are nearly vertical and range between 20 and 25 feet high. In-channel habitat is dominated by a continuous glide feature. A single line of mature oaks and native walnuts line the top of bank while the understory is dominated by poison oak, non-native grasses, and Himalayan blackberry.

Channel widening. Site 9 project elements include the construction of two separate floodplain benches. At the upstream site, an existing berm will be removed and a large (500 ft) floodplain bench would be created that connects to Site 10. The floodplain bench would include a tree island along the existing bank toe to preserve existing trees, willow baffles for floodplain roughness, roughness boulders, and large wood structures. The second floodplain bench would be constructed at the apex of a channel bend and will relieve ongoing erosion along an outside channel bank (Site 7). Both floodplain benches would be graded to provide off-channel refugia and promote the deposition of spawning gravel at the site.

Restoration Site 8

Restoration Site 8 is located downstream of a significant channel bend and is immediately downstream of Site 9 on the right bank of the Napa River. Channel banks at Site 8 are nearly vertical and range between 20 and 25 feet high. In-channel habitat is dominated by a

continuous glide feature. The top of existing channel banks are lined with numerous mature oaks and native walnuts that are severely undercut.

Channel widening. Site 8 project elements include the construction of a single floodplain bench that transitions between Site 9 project elements and the ambient downstream bank condition. At the upstream extent of the site, the floodplain bench will be approximately 30 feet wide. The 300 foot-long bench will transition in width from 30 feet to 5 feet at its downstream terminus and will include extensive biotechnical slope stabilization. This transitional floodplain bench will relieve confined channel conditions at the meander bend and will promote the deposition of spawning gravel and point bar formation at the site.

Restoration Site 7

Restoration Site 7 is on the outside of a bend in the river where existing bank slopes are approximately 1:1 and protected by rip rap. The top of bank is lined with a series of old growth oaks, bays, and walnuts that would be protected. A water supply reservoir and associated infrastructure abuts the channel and is oriented perpendicular to the riparian corridor. During previous high flow events erosion has been documented at the base of the water supply reservoir.

Channel widening. The left bank will be set back to provide additional flow area without impacting existing old growth trees along the top of bank. An existing vineyard access road will be realigned to the top of the irrigation reservoir berm to provide the necessary area for floodplain restoration.

Floodplain restoration. A wetland depression will be graded in the left overbank area behind the existing old growth trees at the site. This seasonal wetland feature will be wetted by the basin upslope from the proposed grading, will provide additional channel conveyance, and associated habitat for terrestrial species.

Restoration Sites 5 & 6

Restoration Sites 5 & 6 are located on an outside bend of the Napa River. The river channel is very narrow and entrenched at these sites.

Channel widening. From Station 148+00 to 122+00 the channel bank will be set back to provide additional flow area. Based on a reference section at Station 149+00, the bank will be graded back to a target corridor width of approximately 90 feet from bank toe to bank toe. The width will be varied where possible to protect identified mature trees that line the right bank, to incorporate flood benches, and maximize retention of gravels in the channel.

Add large wood and boulders. Large wood will be placed in the channel and portions of the secondary channel to enhance maintenance of pools and provide high flow refugia. Large wood placement will include 2 to 4 pieces with intact root structures protruding into the channel. The pieces shall be anchored by burying the trunks in native stream banks and rock ballast. Low profile roughness boulders will also be used to enhance/maintain alternating bars opposite of the pools on the inside of the low flow channel bend.

Restoration Site 4

Restoration Site 4 is located on the left bank upstream of where the Napa River splits to a historic slough or bypass channel.

Floodplain restoration. An existing wetland feature will be enhanced and expanded through grading activities to better connect the wetland with the river and increase its inundation frequency and extent. The existing wetland will be graded in the left overbank area adjacent to the Napa River split so that portion of the wetland feature will flood during a 1.5-year flood event. An existing drainage channel will be realigned at the site to integrate local drainage patterns with the proposed expanded wetland. The expansion of this wetland will also require a realignment of vineyard access roads.

Restoration Site 3

Restoration Site 3 is adjacent to the bypass channel of the Napa River and was suggested by the landowner as a location for active widening.

Channel widening. The existing channel will be widened to include an alcove that provides off-channel refugia.

Floodplain restoration. The adjacent fallow field will be lowered to create a series of depressional features that function as wetland habitat during the wet months. The wetland features will capture local surface flow provide seasonally ponded habitat areas.

Restoration Site 2

Restoration Site 2 is in the split channel reach where the river channel is entrenched and actively eroding. This reach is confined but contains the most diverse habitat conditions in the project reach, with a tightly spaced riffle-pool form. There is abundant utilization by spawning salmon, but the sediment transport assessment showed that spawning gravel is very vulnerable to erosion.

Channel widening. The existing channel banks would be set back to provide a larger cross sectional area that promotes gravel deposition and recruitment.

Add large wood. Large wood will be installed to enhance maintenance of pools, promote spatially complex hydraulic flow fields, and provide immediate habitat improvements for salmonids.

Restoration Site 1

Restoration Site 1 is just downstream of the confluence of the split flow region of the Napa River. The site is highly entrenched and actively eroding.

Channel widening. The existing channel banks would be set back to provide a larger cross sectional area that promotes gravel deposition. The widened cross section will lower channel bed shear and recruit gravel at the site.

Add large wood. Large wood will be installed to enhance maintenance of pools, promote spatially complex hydraulic flow fields, and provide immediate habitat improvements for salmonids.

2.5 Project Implementation

2.5.1 Construction Methods

The County and District's preferred approach for restoration activities is to use the least environmentally impacting approaches, favoring hand implementation over mechanized equipment wherever possible.

Equipment used for channel widening activities, floodplain restoration, and biotechnical stabilization would range from hand tools for small areas or in sensitive locations to mechanized equipment for larger grading needs. When using mechanized equipment, excavators would be located outside the channel on access roads, benches, or adjacent property to minimize disturbance to the existing channel. For project areas where using an excavator from the top-of-bank is not possible, grading would be conducted by lowering smaller equipment directly into the channel from a stream crossing or the adjacent bank. If temporary access ramps are required to lower equipment into the channel, they would be regraded and replanted following grading activities. Where in-channel features are proposed, work areas will be dewatered and in a dry workable condition before equipment would enter the channel. In-channel equipment may include a small Bobcat®, excavators, skid-steer, or walk-behind power-shovels. Sediment removed from the channel or floodplain that cannot be reused onsite, such as to create berms, would be placed in 10- or 20- cubic yard dump trucks and prepared for off-site hauling and disposal.

Where biotechnical stabilization is implemented as a repair, total disturbance would be confined to an area not to exceed 20 feet beyond (landward of) the failed or failing bank or structure, and care would be taken to disturb the least amount of vegetation possible, including mature trees. Biotechnical stabilization activities may include extending arm excavators, small bulldozers (Bobcat style), front-end loaders, and 10 cubic-yard dump trucks. Staging for repair activities would occur on adjacent access roads. Soil and rip-rap, if necessary, would be staged in areas that have been previously disturbed (i.e., service road, turn-outs, etc.). Overgrown vegetation at bank failure sites would only be removed to the extent necessary to repair the bank. Bank stabilization typically requires three to five days to complete.

Dewatering would be required where in-stream structures (gravel augmentation, channel widening, grade control structures, and LWD) are proposed. A temporary diversion system would be used to isolate discrete areas of work to create dry, workable conditions and prevent sediment transport and turbidity in adjacent areas of the river. The temporary diversion system would use a cofferdam to capture and retain water upstream of the areas of work. Water would be diverted around the project site via gravity system through a flexible pipe to a point downstream of the work area. The inlet/intake of the diversion system would be fenced and screened to prevent capture of fish and other aquatic species. The pipe would run along the edge of channel opposite of where work would be performed. The pipe would discharge into a sandbag basin in the channel to dissipate energy at the outlet to avoid mobilization of fine sediment. Pumps may be employed to facilitate

maintenance of work areas. In the event pump systems are used these measures would comply with measures for energy dissipation and sediment control.

Vegetation Removal

Tree Removal and Relocation

As described above, grading activities will minimize, to the extent practicable, the disturbance to existing vegetation at the site. Large healthy native old growth trees greater than 36 inches DBH will be preserved to the extent feasible. Preserved trees will be integrated with landscape design as tree-island features that provide added topographic complexity in the floodplain. Wherever feasible, trees will be left in place to provide habitat for birds and small mammals and to preserve the existing riparian canopy. However, significantly undercut trees, regardless of their size, may be removed as part of channel widening activities and would be repurposed to construct large wood structures.

Table 2-9 lists the number of trees that may be removed at each site. These trees have been identified for removal because they are dying or dead and present a threat to bank failure and sediment increase to downstream areas. Trees may also be removed during implementation of channel widening and floodplain restoration features.

Table 2-9: Summary of Tree Impacts

Restoration Site ID	**Significant Trees Removed**[1] (>12" DBH)
23	10
22	5
21	30
20	10
19	5
18	5
17	10
16	5
15	0
14	35
13	25
12	5
11	0
10	5
9	15
8	15
7	5
6	10
5	35
4	0
3	5
2	10
1	10
Total	**260**

[1] This preliminary table is based on field surveys and measurements during the concept refinement phase as part of a screening tool to minimize impacts to large old growth riparian trees. This list may be adjusted as refined tree surveys are conducted to advance project designs.

Live native trees identified for removal will be evaluated for potential relocation to other channel sites. Desirable trees for relocation will typically have a single trunk, straight vertical orientation, and good long-term potential to provide riparian canopy. Target species for relocation include alders, red willow, or Pacific willow. The relocation site will be evaluated to ensure that the introduced tree will not create a flood threat. The tree removal process will preserve the tree's root structure, include pruning to compensate for root damage, and provide immediate planting and irrigation at the new site. For all tree removal activities, the vacated tree site will be treated like a bank stabilization project, using bioengineered techniques (described in Section 2.3.C above) to back fill and stabilize the excavated root zone.

Utility Relocation

Given the scale of the Proposed Project and adjacent agricultural land uses the probability of encountering private and public utilities (wells, pumps, joint poles, vineyard infrastructure) is high. The proposed site designs have been developed with landowner input to avoid or minimize the impact to existing private utilities at each site. Landowners would be responsible for relocating private irrigation supply lines, pumps, wells, and water intakes where relocations are required. Grading and site layout have been designed to avoid or minimize the impact to existing public utilities. No sewer lines, groundwater wells, phone, cable, or waters supply lines would be impacted by the Proposed Project. However, channel widening activities may require limited joint pole relocation. The County and design engineers will coordinate joint pole relocation with Pacific Gas & Electric (PG&E) and to the extent practicable amend design grading to integrate existing joint poles and provide continued maintenance access.

Sediment Reuse and Disposal

The Proposed Project activities (channel widening, floodplain restoration, instream features, etc.) will generate approximately 490,000 cubic yards of material. Berm reconstruction and design requirements would reuse approximately 87,000 cubic yards. The remaining 403,000 cubic yards would be hauled offsite for various uses including general fill for nearby construction projects and soil for vineyard operations. Disposal sites would be determined annually and may vary for each construction phase. Off-haul locations would be within 10 miles from the project site.

2.5.2 Timing of Work

Due to the size and cost of the project, numerous phases of construction will be required. Phase 1 is currently funded for final design, CEQA evaluation, and project permitting. Phase 1 includes the northern portion project area from Oakville Crossroad to the sites immediately downstream of the Yountville Crossroad (Sites 23 through Site 11). Phase 2 includes the remaining sites downstream to Oak Knoll Avenue (Site 10 through Site 1). The order of final design and construction will be determined by funding availability but will be organized to limit disturbance.

The anticipated groups of restoration sites that would be constructed together are shown in **Table 2-10** and depicted on Figures 2-2a and 2-2b. Construction of multiple sites may occur in one season, and the construction groups may take more than one year to complete.

Table 2-10: Potential Project Construction Groups

Construction Grouping	Restoration Sites to be Constructed Together
A	3, 4, 7, 21, 22, 23
B	15, 16, 17, 18, 19, 20
C	11, 12, 13, 14
D	1, 2, 5, 6, 8, 9, 10

Construction of the first group of restoration sites may begin as early as the summer of 2015, with subsequent phases being constructed each year thereafter through 2019 (over 5 years) depending on project funding.

2.5.3 Environmental Commitments

Project construction would include a range of Environmental Commitments, otherwise known as best management practices (BMPs), to avoid and minimize adverse effects on people and the environment. Environmental Commitments are developed to address anticipated effects on particular types of resources from various construction activities. Environmental Commitments are implemented pre-construction, during construction, and post-construction as specified. The Environmental Commitments for the Proposed Project are included at the end of this chapter in **Table 2-11**.

2.6 Project Monitoring and Adaptive Management

Restored Project areas will be monitored following construction to ensure that each restoration area performs as designed and meets project objectives. It is likely that the permits for the project will require monitoring to demonstrate that requirements have been met. For example, a common monitoring requirement is to evaluate post-project planting to evaluate the success of new plantings, or a description of how instream features have performed over time.

The Proposed Project will include adaptive management strategies in the event that post-project conditions are not meeting original project designs or objectives. Examples of adaptive management actions are described below.

Long-term adaptive management of the project will be conducted by the County and Napa County Flood Control and Water Conservation District (District), in partnership with landowners. The maintenance program will be consistent with the Rutherford Reach, upstream from the Oakville to Oak Knoll Reach, and with the District's Stream Maintenance Program Manual. The District's monitoring and maintenance approach is designed to place reach scale restoration activities within a watershed context.

The adaptive management framework links project objectives to proposed monitoring elements based on the understanding of process-based relationships between existing conditions and restoration techniques aimed at achieving desired outcomes. The monitoring program provides a basis for evaluating the function of specific restoration features and informs annual maintenance activities. The Monitoring Program will entail an Annual Survey of the entire 9 mile reach, which uses a function-based stream assessment framework that may be event based and channel maintenance needs using rapid assessment formats. Monitoring activities could consist of activities such as vegetation surveys, channel morphology survey, fisheries survey, wildlife surveys, and photo documentation of structures.

The Monitoring Program is designed to evaluate the success of the Project at meeting the objectives of reducing excessive channel bank and bed erosion, enhancing aquatic and riparian habitat, and protecting property. The Monitoring Program is organized around the Project Objectives and is designed to address progress towards meeting stated project goals and informing maintenance needs. **Table 2-12** provides the restoration actions, monitoring parameters, maintenance triggers, and maintenance actions to be implemented for the Project.

Table 2-12: Monitoring Program Implementation Guidelines

Restoration Action	Monitoring Parameter	Maintenance Triggers	Maintenance Actions
Stabilize actively eroding banks with biotechnical methods	▪ Eroding stream bank survey ▪ Napa RCD fisheries studies	▪ Bank erosion advances significantly from previous monitoring period ▪ Biotechnical stabilization feature fails or is experiencing erosion	▪ Continue Monitoring ▪ Erosion control Environmental Commitment ▪ Biotechnical bank stabilization improvement ▪ Minor grading ▪ Riparian Planting
Widen selected reaches to create inset floodplains benches and secondary channels	▪ Channel morphology survey	▪ Sediment deposition degrades the function of restoration feature ▪ Erosion degrades the function of restoration feature	▪ Continue Monitoring ▪ Vegetation maintenance ▪ Erosion control Environmental Commitment ▪ Biotechnical bank stabilization ▪ Riparian planting
Add in-channel large wood & roughness boulders	▪ Large woody debris survey ▪ Survey of California fresh water shrimp habitat structures ▪ Napa RCD fisheries studies	▪ Restoration feature fails or the function is degraded ▪ Sediment aggrades and buries a structure ▪ Erosion threatens the stability of the structure ▪ Debris jam or blockage degrades the function	▪ Continue monitoring ▪ Debris management ▪ Biotechnical bank stabilization ▪ Replace LWD structure or boulders ▪ Install new utility, log pin or boulder and cable anchor
Augment channel with gravel	▪ Channel Geomorphology survey ▪ Erosion/deposition pins	▪ Gravel mobilizes downstream ▪ Gravel augmentation areas become heavily vegetated and begins aggrading ▪ The designed function is degraded	▪ Continue monitoring ▪ Vegetation maintenance ▪ Augment channel with gravel at site or upstream
Floodplain Restoration	▪ Channel Geomorphology survey ▪ Erosion/deposition pins ▪ Vegetation survey	▪ Abundant nonnative invasive vegetation growth ▪ Sediment deposition degrades intended function ▪ Significant Erosion of restoration feature or bank	▪ Continue monitoring ▪ Vegetation maintenance ▪ Riparian planting ▪ Biotechnical bank stabilization
Expand Riparian Forest	▪ Vegetation survey	▪ Abundant nonnative invasive vegetation growth ▪ Riparian restoration plant mortality exceeds 20% of installed plants within the first three years ▪ Erosion of restoration feature	▪ Continue monitoring ▪ Vegetation maintenance ▪ Riparian Planting ▪ Hand watering ▪ Erosion control Environmental Commitment

The adaptive management strategy consists of assessing annual monitoring data to determine if restoration elements are functioning as intended. In the event that a restoration element is not meeting its intended purposes the restoration team will review the issue and prescribe a maintenance action that can be implemented to restore the intended function. Alternatively, the District may continue monitoring the restoration feature over multiple years to see if it develops the intended function over time. The adaptive management strategy is based on the understanding that rivers are dynamic systems and allows for the District to make professional judgments in prescribing or not prescribing maintenance actions. In the event that a restoration element fails the District will evaluate the site to determine if it is providing an unintended function that is valuable to the project, in the event that it is determined that the restoration element is not providing a valuable function to the project then a maintenance action or larger design solution may be implemented.

2.7 Project Maintenance Program

Routine maintenance activities will be funded through property tax assessments collected from local landowners through a Special Benefit Zone Project adopted by the District for the Oakville to Oak Knoll Reach. The District will retain an assessment engineer to develop a basis for assessing individual landowners to fund the program. At this time, it is anticipated that each landowner will be assessed based on the total lineal footage of stream bank and size of restoration feature located within their property on an annual basis (adjusted annually for inflation per the construction cost index). However, this may change based on future needs. In years where maintenance expenditures are less than the total assessment collected by the District, any remaining funds will be retained in an interest-bearing account to fund maintenance activities conducted in future years.

Annual Maintenance Survey

District staff will conduct routine (at least once a year) surveys to identify and assess issues of concern relative to the project objectives. Surveys will focus on identifying, mapping, and assessing:

- Actively eroding streambanks, managed streambank retreat areas, including effectiveness of prior stabilization measures.
- Areas of excessive vegetation growth, and/or accumulations of LWD or trash that are contributing to streambank erosion.
- Storm-related damages to streambank stabilization and aquatic habitat enhancement structures
- Weed eradication, Pierce's Disease host plant status, and revegetation sites.

The District will use its standard stream maintenance survey data sheets. Data sheets, aerial photographs, and GPS units will be used to document the nature and extent of issues encountered during surveys, and to identify recommended treatments or remedial actions. Photos will also be taken to document each problem site. The results of the surveys will be compiled into a report and presented to the landowners for review. It may also be necessary to conduct interim river surveys shortly after large storm events (> 10-year flood event) to identify areas that may require immediate treatment to prevent additional streambank failure, and protect existing infrastructure and environmental resources.

Landowner Maintenance Requests

In addition to maintenance needs identified through the annual river survey, landowners will be able to submit individual maintenance requests to the District for review and evaluation. Maintenance requests will be limited to the following problem types: actively eroding streambanks; debris accumulations; downed trees/LWD; vegetation removal; and storm-related damages to streambank stabilization and aquatic habitat enhancement structures, and revegetation sites.

Maintenance requests would be submitted to the District by April 1 each year to be considered for inclusion in that years' stream maintenance work plan. Maintenance of earthen berms, access roads, and other infrastructure is not included in the maintenance program and will be the responsibility of individual landowners.

Evaluation and Triggers for Maintenance Activities

As described above, the annual river survey report and any individual landowner maintenance requests will be considered by the District annually. The District will evaluate and prioritize annual work activities based on the following considerations:

- Condition of existing bank stabilization and instream habitat enhancement structures.
- Potential for future significant streambank failure/erosion beyond the riparian corridor and vegetated buffer.
- Risk to adjacent infrastructure and agriculture (i.e., structures, earthen berms, roads, pumps, utilities, crops).
- Potential for future significant streambank failure/erosion.
- Potential for increased flood risk.
- Potential to enhance or expand riparian corridor.
- Available budget

Based on an evaluation and prioritization of problems identified through the annual river survey and landowner requests, the District will prepare a work plan describing the location and scope of maintenance activities proposed to be conducted that year. The work plan will not be implemented until landowner approval is received. Following completion of annual maintenance activities, the District will prepare a supplemental report documenting work completed that year, associated costs, remaining budget, and adequacy of funding to complete required maintenance.

Maintenance Activities

The District takes an integrated maintenance approach that involves protecting and enhancing existing instream resources while ensuring that the restoration features are functioning as intended. As described above, the maintenance program is intended to proactively address streambank erosion and failure, in order to protect environmental resources and properties within the project reach and maintain features constructed as part of the Proposed Project. It also includes activities to control target invasive non-native and Pierce's Disease host plants within the riparian corridor. The maintenance program is not intended to address catastrophic streambank failure, emergency repairs, or significant streambank erosion in areas not treated by this restoration project. Such repairs would be

implemented by individual landowners in coordination with appropriate agencies. Other non-emergency treatments that fall outside the scope of the maintenance program because of their scale or cost may be addressed under the District's larger Stream Maintenance Program.

The following sections describe the specific types of activities included in the maintenance program. Each year, the activities identified in the annual work plan will be implemented by District staff, or by landowner-supplied work crews overseen by District staff. For some activities (depending on the nature and scope of the work they entail), maintenance crews will also be required to implement measures to avoid and/or minimize environmental impacts; this is described further in the Best Management Practices section below.

Maintenance of Constructed Features

Constructed features such as biotechnical stabilization areas and habitat enhancement structures will need to be monitored to ensure that they are performing correctly and identify any areas of damage or failure. Depending on their performance, some features may require repair or maintenance.

During the first 3 years following restoration, the contractor(s) selected by the County to implement the restoration project will be responsible for monitoring and maintenance of all constructed features. Once the initial post-construction monitoring and maintenance period has elapsed and the County has accepted the project as successfully completed, all project features will transition to the Oakville to Oak Knoll maintenance program, under the oversight of the District.

Maintenance activities for constructed features are expected to include the following:

- Controlling weeds and other non-native invasive plants.
- Minor vegetation pruning.
- Replanting native species.
- Hand watering.
- Installation & repair of erosion control fabric and coir logs.
- Minor grading.
- Installation & repair of biotechnical bank stabilization elements.
- Replacing logs and boulders.
- Installing new utility or boulder and cable anchors.

<u>Preventative Maintenance Activities</u>

The District's maintenance activities will be implemented to enhance or develop instream complexity features, improve bank conditions, and expand native riparian plant communities. Certain activities may be implemented proactively within the project reach to prevent streambank erosion and failure, and associated impacts to adjacent properties and environmental resources.

Downed Tree Management

In alignment with the Sediment Total Maximum Daily Load (TMDL) for the Napa River watershed, the District seeks to promote recruitment of woody debris in channels to benefit instream habitat. The District may leave down trees in place or modify down trees to encourage formation of channel features such as scour pools and slack water areas which are used by juvenile salmonids and increase stream channel complexity. However, if the tree threatens flood conveyance capacity or channel stability (i.e., stream banks destabilization), the District may modify the downed tree by trimming off branches or cutting it into smaller pieces. If further action is needed to minimize the potential for flow obstruction, the District may reposition the tree in the channel, such as move from perpendicular to parallel to stream flow, or remove the tree entirely. Downed tree management is generally conducted during the dry season, but can occur year-round to prevent flooding or erosion.

Debris Removal

Removal of debris such as tires, shopping carts, barrels, and other trash the deposits within the Project will be removed from the channel and disposed of at appropriate disposal sites. Debris removal may include clearing of vegetation debris that racks up on restoration features, on downed trees, or on other channel vegetation. Debris jams will be disassembled if they are significantly blocking the channel, redirecting flows and causing erosion issues, or degrading the function of a restoration feature. Methods used to remove debris will vary depending upon the size of material and available access. When feasible, debris removals activities will be conducted by work crews using hand tools. However, removal of larger materials may require the use of heavy equipment. Native vegetative debris may be cut up or chipped on-site, removed and transported to a suitable disposal site, or burned in accordance with state and local permits. Non-native vegetative debris (i.e., giant reed) and non-native vegetative debris will be removed and transported to a suitable disposal site, mulched (for materials that do not contain viable seed) in place, or burned in accordance with state and local permits.

Vegetation Management

Vegetation management refers to the trimming, pruning, mowing, and removal of vegetation. Vegetation management may be necessary to control weeds to support the establishment of restoration plantings. In some cases vegetation may cause flow constrictions or increase erosion in which case minor pruning may be necessary. Vegetation management also includes the removal on non-native invasive species and Pierce's Host Vegetation as described below.

In-Channel Vegetation: Within the Project, native vegetation such as willows, generally occur on low floodplain benches and at the toe of the streambank. While these plants provide habitat for native species, they are also effective at trapping sediment leading to the development of substantial in-channel gravel bars that shift stream flows and cause streambank erosion and failure. Willows and other species (<4 inches in diameter) may be pruned or removed in areas where they significantly impeded stream flow or are causing bank erosion issues.

In-channel vegetation will be removed by hand crews using loppers, hand saws, and chain saws. In cases where herbicide use is considered advantageous and it's consistent with the landowner's property management regime, trees may be cut off at the base of the trunk and the sump painted with an approved herbicide. Herbicide will be applied according to

manufacturer's specifications by licensed applicators in a manner that minimizes drip and drift into the stream channel. Only U.S. Environmental Protection Agency-approved aquatic formulations of glyphosate (e.g., Aquamaster, Aqua Neat/Roundup, Rodeo) and imazapyr (e.g., Habitat/Stalker) will be used. In cases where herbicide use is not consistent with the landowner's property management regime, physical removal techniques alone may be employed. If necessary, cuttings may be removed from the channel and stockpiled at top of bank. Debris may be transported to a suitable disposal site or mulched in place.

Invasive Non-Native and Pierce's Diseases Host Vegetation: A number of invasive non-native and Pierce's disease host plants occur within the Project. These species reduce the value of habitat for native wildlife by preventing the establishment and growth of desirable native species, and decreases overall plant diversity. Additionally, some of these species act as host plants for the bacterium that causes Pierce's disease resulting in significant damage to streamside vineyards. Although existing patches of target invasive non-native plants will be treated as part of the Project, success of the restoration effort will rely on ongoing maintenance to control spread of these undesirable species throughout the reach. Key invasive nonnative and Pierce's disease host plants that may be targeted for removal include, but are not limited to:

- Himalayan blackberry (*Rubus discolor*)
- Periwinkle (*Vinca major)*
- Giant reed (*Arundo donax)*
- Tree of heaven (*Alianthus altissima)*
- Sesbania (*Sesbania punicea)*
- Wild grape (hybrid) (*Vitis* spp*).*
- Mulefat (*Baccharis salicifolia)*

Target invasive non-native and Pierce's disease host plants will be removed by hand crews using weed wrenches, bladed weed eaters, loppers, hand saws, chain saws, and at times a rubber tracked skid steer with flail mower may be used outside of the wetted channel. Herbicied application will be limited to cutting and painting stumps, or foliar spot spray using backpack, ATV or Truck-mounted sprayers. Herbicide will be applied according to manufacturer's specifications by licensed applicators in a manner that minimizes drip and drift into the stream channel. Only U.S. Environmental Protection Agency-approved aquatic formulations of glyphosate (e.g., Aquamaster, Aqua Neat/Roundup, Rodeo) and imazapyr (e.g., Habitat/Stalker) will be used.

Erosion Control/Bank Stabilization

The repair and stabilization of stream banks is undertaken when a bank is weakened, unstable, or failing. In areas where minor erosion has been identified, biotechnical methods may be used which incorporates live vegetation with other natural elements (e.g., wood, biodegradable erosion control products, rock) to provide structural stability to streambanks. Bank stabilization approaches, including erosion control fabric with coir logs, brush mattresses, willow walls, encapsulated soil lifts, and crib walls. Typically these treatments will be implemented in combination with riparian planting projects to stabilize eroding streambanks and enhance native riparian plant communities. Erosion control and Biotechnical bank stabilization elements will be installed using hand tools, however some

projects may require the use of a small excavator staged along the top of bank to perform minor grading or to place material. Hardscape rock materials may be used only at the toe of streambanks in combination with these measures if no effective alternative is feasible due to the magnitude of hydraulic forces involved, the need to protect infrastructure, or an adjacent land use constraint. In the event that the erosion or bank failure is catastrophic or exceeds the maximum linear footage of Biotechnical stream bank stabilization projects allowed by regulatory permits, then the landowner will be responsible for the repair but may be eligible for funding support through the District's Stream Bank Stabilization Cost Share Program.

Riparian Planting

Areas subject to minor erosion may be hydroseeded with an appropriate native or sterile seed mix, and/or planted with native riparian species to stabilize eroding banks, and reduce localized flow velocities and erosion potential. The goal of riparian planting is to enhance habitat for fish, birds, amphibians and other wildlife using terrestrial riparian areas while providing shading, sources of organic matter and coarse woody debris, and water quality benefits to aquatic species. The planting palette will be consistent with Table 2-6, the list of species will evolve to mimic the successional development of the riparian forest. Opportunities for riparian planting and restoration will be evaluated on a case-by-case basis at all maintenance locations within the Project.

Culvert Repair

Existing drainage culverts and drop inlets within the Project that are blocked or in need of repair may contribute to overtopping flows (due to poor drainage) which can increase the opportunity for bank erosion or bank failure due to saturated soils. The clearing and repair of these structures will be coordinated with individual landowners. The goal of culvert inspection and repair is to ensure that existing infrastructure does not adversely impact the restoration projects or degraded bank conditions and aquatic resources. The District will implement minor erosion control or bank stabilization project as a preventative measure if a drainage structure is contributing to bank erosion. In the case the structure needs to be replaced the landowner will be responsible for the cost of replacing the structure but the District will provide technical oversight to ensure the replacement is done in a manner that minimize or avoids potential impacts. In some cases a small amount of hardscape may be necessary at the toe-of-slope to provide added erosion protection for the bank. Repairs may require the use of erosion control materials such as coir logs, coir blankets, brush mattresses, or soil lifts. In some cases larger equipment such as a mini-excavator may be staged along the top of bank to facilitate minor grading actions or to place material.

The following impact avoidance guidance applies to the District's maintenance of drop-inlet culverts:

- Repair of an existing culvert will occur within the same footprint as the original culvert.
- The culvert outfall path, from the culvert edge down to toe-of-slope will be protected with erosion control material as needed to dissipate energy and reduce the erosion potential.
- The culvert repair will be installed to minimize outfall velocity and reduce the potential for future bank erosion and scour from outfall. Energy dissipation approaches will be used as needed.

Managed Streambank Retreat

The goal of managed streambank retreat is to create a more expansive riparian corridor for terrestrial species and wider channel cross section that supports long-term habitat sustainability. It is a passive restoration technique that allows landowners to participate in riparian restoration as part of the Stream Assessment District. In a managed streambank retreat zone a landowner may choose to remove vineyard to install an alternative agricultural crop consistent with an Agrforestry model of a riparian buffer zone or restore the area with native riparian and upland plant species. Within the managed streambank retreat zone landowners are agreeing to allow the river to naturally expand with the understanding that a maintenance action will take place to stabilize the stream bank before it reaches the defined managed retreat line. Typical maintenance actions will include the planting of native riparian and upland species, invasive and Pierce's disease plant management, biotechnical bank stabilization, laying the bank back to a stable slope and erosion control measures. The District will collaborate with landowners to manage these areas in a manner that meets the Project objectives and is consistent with the landowner's land management regime.

Specific maintenance actions within managed streambank retreat zones are highly dependent upon site-specific conditions and will vary depending on the landowner's level of participation. The District will implement the above maintenance actions within these zones using a variety of methods using hand tools, power tools and small equipment such as skid steer or small excavator. In the event that a site experiences large scale retreat or erosion the District will collaborate with the landowner to identify a solution and potentially provide funding support through the District's Stream Bank Stabilization Cost Share Program to help the landowner design, permit and implement a larger biotechnical streambank stabilization project.

2.8 Required Permits and Approvals

The permits and regulatory compliance requirements for the Proposed Project are described in **Table 2-13** by permitting agency. In addition to the requirements summarized below, the project must conform to the policies and standards established in the current Napa County General Plan, which is relevant to all resource topics analyzed under CEQA.

Table 2-13. Permit and Regulatory Requirements Applicable to the Proposed Project

Regulatory Agency	Law/Regulation	Purpose	Permit/Authorization Type
U.S. Army Corps of Engineers – San Francisco District	Clean Water Act (CWA) Section 404	Regulates placement of dredged and fill materials into waters of the United States.	Individual Permit
	Rivers and Harbors Act Section 10	Regulates work in navigable waters of the U.S.	Section 10 Compliance
San Francisco Bay Regional Water Quality Control Board	CWA Section 401	Water quality certification for placement of materials into waters of the United States.	401 Water Quality Certification is required for federal permits
	CWA Section 402	National Pollutant Discharge Elimination System (NPDES) program regulates discharges of pollutants.	NPDES Aquatic Pesticides General Permit if pesticides will be applied below OHWM. NPDES General Construction Permit notification prior to project construction.
	CWA Section 303	Recognition and remediation of impaired water bodies through establishment of Total Maximum Daily Loads (TMDLs) to track and reduce pollutants and restore beneficial uses.	Napa TMDLs - Sediment (adopted by Regional Board in 2009 and by the State Board in 2010; Awaiting Federal approvals) - Pathogens (approved by USEPA in 2006) - Nutrients (currently under development)
	Porter-Cologne Water Quality Control Act	Regulates discharges of materials to land and protection of beneficial uses of waters of the State.	Waste Discharge Requirements (WDRs)
California Department of Fish and Wildlife (CDFW) – Bay Delta Region	Fish and Game Code (F&G Code) Section 1600	Applies to activities that will substantially modify a river, steam or lake. The Agreement includes reasonable conditions necessary to protect those resources.	Notification of Streambed Alteration (1602 permit)
	California Endangered Species Act (CESA) (F&G Code Section 2081[b])	CESA compliance: Issuance of incidental take agreements	CESA compliance will be completed as directed by CDFW

Regulatory Agency	Law/Regulation	Purpose	Permit/Authorization Type
USFWS/ National Marine Fisheries Service (NMFS)	Endangered Species Act (ESA)	USACE must consult with USFWS and NMFS if threatened or endangered species may be affected by the project.	Biological Opinions issued in conjunction with USACE Section 404 compliance
State Historic Preservation Officer	NHPA Section 106	USACE must consult with State Historic Preservation Officer if historic properties or prehistoric archaeological sites may be affected by the project.	Consultation in conjunction with USACE Section 404 compliance
California Department of Transportation	California Vehicle Code, Division 15, Section 35780	Transportation permits are required for movement of oversized or excessive load vehicles on state roadways.	Transportation Permit for construction-related hauling on State Route 29
County of Napa	County Code	Grading over 50 cubic yards requires a County Grading Permit. Work in the active floodway of the Napa River requires a Floodplain Management Permit from the County.	County Grading and Floodplain Management Permits
	Federal Code of Regulations – Title 44 Emergency Management and Assistance	The Project may affect the hydraulic characteristics of a flooding source and thus result in the modification of the existing regulatory floodway, the effective Base Flood Elevations, or the Special Flood Hazard Area.	If required, the County will file a Conditional Letter of Map Revision (CLOMR) issued by the Federal Emergency Management Agency (FEMA)

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Table 2-11: Proposed Project Environmental Commitments Table

Number	Title	Environmental Commitment Description
General Environmental Commitments These Environmental Commitments will be implemented by the County and its Contractors, as appropriate, for all activities associated with the Proposed Project. These Environmental Commitments are grouped according to use of general construction practices, public safety, and reporting procedures. The majority of these Environmental Commitments are implemented prior to and during construction.		
EC-1GEN	Work Windows	A. All ground-disturbing (e.g., clearing, grubbing, grading, bank stabilization) and in-stream activities (e.g., aquatic habitat enhancements) will take place between June 15 and October 15. B. Vegetation maintenance outside of the main channel may occur year round, except when wheeled or tracked equipment needs to access a project site by crossing a creek, ponded area, or secondary channel.
EC-2GEN	Minimize the Area of Disturbance	To minimize impacts to natural resources, soil disturbance will be kept to the minimum footprint necessary to complete the restoration action.
EC-3GEN	Erosion and Sediment Control Measures	A. All soils disturbed or exposed during construction activities will be seeded and stabilized using erosion control fabric or hydromulch. The channel bed and areas below the Ordinary High Water Mark (OHWM) are exempt from this Environmental Commitments. B. Erosion control fabrics will consist of natural fibers that will biodegrade over time. No plastic or other non-porous material will be used as part of a permanent erosion control approach. Plastic sheeting may be used to temporarily protect a slope from runoff. C. Erosion control measures will be installed according to manufacturer's specifications. D. Appropriate measures include, but are not limited to, the following: o Silt Fences o Straw Bale Barriers o Brush or Rock Filters o Storm Drain Inlet Protection o Sediment Traps o Sediment Basins o Erosion Control Blankets and Mats o Soil Stabilization (i.e., tackified straw with seed, jute or geotextile blankets, broad cast and hydroseeding, etc.) E. All temporary construction-related erosion control methods (e.g., silt fences) shall be removed at the completion of each construction season, or as directed by a certified erosion control specialist.

Table 2-11: Proposed Project Environmental Commitments Table

Number	Title	Environmental Commitment Description
EC-4GEN	Dust Management Controls & Air Quality Protection	The County will implement the Bay Area Air Quality Management District's (BAAQMD) Basic Dust Control Measures (www.baaqmd.gov) at Project sites less than four acres in size. Current measures stipulated by the BAAQMD Guidelines include the following: A. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. B. All haul trucks transporting soil, sand, or other loose material off-site shall be covered. C. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. D. All vehicle speeds on unpaved roads shall be limited to 15 mph. E. All roadways and driveways to be paved shall be completed as soon as possible. F. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points. G. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator. H. Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.
EC-5GEN	Staging and Stockpiling of Materials	A. To the extent feasible, staging will occur on access roads, vineyard land, or other disturbed areas that are already compacted and only support ruderal vegetation. Similarly, all maintenance equipment and materials (e.g., road rock and project spoil) will be contained within the existing service roads, paved roads, or other pre-determined staging areas. Staging areas for equipment, personnel, vehicle parking, and material storage will be sited as far as possible from major roadways. B. Stockpiling of materials, including portable equipment, vehicles and supplies (e.g., chemicals), will be restricted to the designated construction staging areas. C. No runoff from the staging areas may be allowed to enter water ways, including the river channel, tributaries, or storm drains, without being subjected to adequate filtration (e.g., vegetated buffer, hay wattles or bales, silt screens). The discharge of decant water to waterways from any on-site temporary sediment stockpile or storage areas is prohibited. D. During the dry season, if stockpiled soils will remain exposed and unworked for more than 7 days then erosion control measures will be utilized. During the wet season, no stockpiled soils will remain exposed, unless surrounded by properly installed and maintained silt fencing or other means of erosion control.

Table 2-11: Proposed Project Environmental Commitments Table

Number	Title	Environmental Commitment Description
EC-6GEN	Stream Access	Construction access points will be developed in a manner that minimizes impacts according to the following guidelines: A. Prior to conducting in-channel work, the County will identify the limits of the required access routes and encroachment into the stream. The County will restrict access routes and encroachment into the stream to the maximum extent while still allowing for necessary activities to be completed. B. Access points will be constructed as close to the work area as possible to minimize equipment transport. C. Disturbed areas will be revegetated or filled with compacted soil, seeded, and stabilized with erosion control fabric immediately to prevent future erosion. D. Personnel will use the appropriate equipment for the job that minimizes impacts. Appropriately-tired vehicles, either tracked or wheeled, will be used depending on the site and maintenance activity.
EC-7GEN	On-Site Hazardous Materials Management	A. An inventory of all hazardous materials used (and/or expected to be used) at the worksite and the end products that are produced (and/or expected to be produced) after their use will be maintained by the worksite manager. B. As appropriate, containers will be properly labeled with a "Hazardous Waste" label and hazardous waste will be properly recycled or disposed of off-site. C. Contact of chemicals with precipitation will be minimized by storing chemicals in watertight containers or in a storage shed (completely enclosed), with appropriate secondary containment to prevent any spillage or leakage. D. Petroleum products, chemicals, cement, fuels, lubricants, and non-storm drainage water or water contaminated with the aforementioned materials will not contact soil and not be allowed to enter surface waters or the storm drainage system. E. All toxic materials, including waste disposal containers, will be covered when they are not in use, and located as far away as possible from a direct connection to the storm drainage system or surface water. F. All trash that is brought to a project site during construction and maintenance activities (e.g., plastic water bottles, plastic lunch bags, cigarettes) will be removed from the site daily.
EC-8GEN	Existing Hazardous Materials	If hazardous materials, such as oil, batteries or paint cans, are encountered at the maintenance sites, the County will carefully remove and dispose of them according to the *Spill Prevention and Response Plan* (see measure EC-9GEN). County staff will wear proper protective gear and store the waste in appropriate hazardous waste containers until it can be disposed at a hazardous waste facility.

Table 2-11: Proposed Project Environmental Commitments Table

Number	Title	Environmental Commitment Description
EC-9GEN	Spill Prevention and Response	The County will prevent the accidental release of chemicals, fuels, lubricants, and non-storm drainage water into channels following these measures: A. All field personnel will be appropriately trained in spill prevention, hazardous material control, and cleanup of accidental spills. B. Equipment and materials for cleanup of spills will be available on site and spills and leaks will be cleaned up immediately and disposed of according to guidelines stated in the *Spill Prevention and Response Plan* (developed by the Contractor and approved by the County). C. Field personnel will ensure that hazardous materials are properly handled and natural resources are protected by all reasonable means. D. Spill prevention kits will always be in close proximity when using hazardous materials (e.g., at crew trucks and other logical locations). All field personnel will be advised of these locations. E. County staff will routinely inspect the work site to verify that spill prevention and response measures are properly implemented and maintained. *Spill Response Measures:* For small spills on impervious surfaces, absorbent materials will be used to remove the spill, rather than hosing it down with water. For small spills on pervious surfaces such as soil, the spill will be excavated and properly disposed rather than burying it. Absorbent materials will be collected and disposed of properly and promptly.
EC-10GEN	Vehicle and Equipment Maintenance	A. All vehicles and equipment will be kept clean. Excessive build-up of oil and grease will not be accepted. B. All equipment used for in-channel work will be inspected for leaks each day prior to initiation of work. Action will be taken to prevent or repair leaks, prior to use. C. Incoming equipment will be checked for leaking oil and fluids. Leaking equipment will not be allowed onsite. D. No heavy equipment will operate in a live stream (see measure EC-12GEN). E. No equipment servicing will be done in the channel or immediate floodplain, unless equipment stationed in these locations cannot be readily relocated (i.e., pumps and generators). F. If necessary, all servicing of equipment done at the job site will be conducted in a designated, protected area to reduce threats to water quality from vehicle fluid spills. Designated areas will not directly connect to the ground, surface water, or the storm drain system. The service area will be clearly designated with berms, sandbags, or other barriers. Secondary containment, such as a drain pan, to catch spills or leaks will be used when removing or changing fluids. Fluids will be stored in appropriate containers with covers, and properly recycled or disposed of offsite. Continued on next page.

Table 2-11: Proposed Project Environmental Commitments Table

Number	Title	Environmental Commitment Description
		G. If emergency repairs are required in the field, only those repairs necessary to move equipment to a more secure location will be conducted in the channel or floodplain. H. Equipment will be cleaned of any sediment or vegetation before entering the work area to avoid spreading pathogens or exotic/invasive species. I. Vehicle and equipment washing can occur onsite only as needed to prevent the spread of sediment, pathogens or exotic/invasive species. No runoff from vehicle or equipment washing is allowed to enter water bodies, including channels and storm drains, without being subjected to adequate filtration (e.g., vegetated buffers, hay wattles or bales, and silt screens).
EC-11GEN	Vehicle and Equipment Fueling	A. No fueling will be done in the channel (top-of-bank to top-of-bank) or immediate floodplain unless equipment stationed in these locations cannot be readily relocated (e.g., pumps and generators). For stationary equipment, secondary containment, such as a drain pan or drop cloth, will be used to prevent accidental spills of fuels from reaching the soil, surface water, or the storm drain system. B. All non-stationary equipment fueling will be done in staging areas equipped with secondary containment and avoid a direct connection to soil, surface water, or the storm drainage system.
EC-12GEN	Dewatering Measures	*Design:* A. The channel will be dewatered or streamflow will be diverted around the work area for Project activities that involve in-channel grading, gravel augmentation, and grade control structures. B. Pre-construction surveys for special status amphibians and California freshwater shrimp will be conducted at least 5 days before the start of construction by a USFWS-approved biologist. The service-approved biologist will remain onsite for the entire dewatering period to capture, handle, and relocate special status amphibians or shrimp, if necessary. After the pre-construction surveys and dewatering is complete, the Service-approved biologist will train an Environmental Mentor and the entire construction crew on proper identification procedures for special status amphibians and California freshwater shrimp. The environmental monitor will then conduct daily monitoring of the worksite and have the authority to halt work if needed to protect detected species. C. Downstream flows adequate to prevent fish or vertebrate stranding will be maintained at all times during dewatering activities D. Prior to dewatering, the best means to bypass flow through the work area will be determined to minimize disturbance to the channel and avoid direct mortality of fish and other aquatic vertebrates. The contractor will be required to submit a dewatering plan which will be subject to review and approval by the Regional Water Quality Control Board, California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, and National Marine Fisheries Service.

Table 2-11: Proposed Project Environmental Commitments Table

Number	Title	Environmental Commitment Description
		E. The area to be dewatered will encompass the minimum area necessary to perform the restoration activity. F. The period of dewatering will extend only for the minimum amount of time needed to perform the maintenance activity. *Construction*: A. Where feasible and appropriate, dewatering will occur via gravity driven systems. B. Construction of cofferdams will begin in the upstream area and continue in a downstream direction, and the flow will be diverted only when construction of the dams is completed. C. Coffer dams will be installed both upstream and downstream not more than 100 feet from the extent of the work areas. D. Instream cofferdams will only be built from materials such as sandbags, clean gravel, or rubber bladders which will cause little or no siltation or turbidity. No earthen fill will be used to construct the cofferdam. Plastic sheeting will be placed over sandbags to minimize water seepage into the maintenance areas. The plastic sheets will be firmly anchored to the streambed to minimize water seepage. If necessary, the footing of the cofferdam will be keyed into the channel bed at an appropriate depth to capture the majority of subsurface flow needed to dewater the streambed. E. Stream flows will be allowed to gravity flow around or through the work site using temporary bypass pipes or culverts. Bypass pipe diameter will be sized to accommodate, at a minimum, twice the volume of the summer baseflow. F. When use of gravity-fed dewatering is not feasible and pumping is necessary to dewater a work site, a temporary siltation basin and/or use of silt bags may be required to prevent sediment from re-entering the wetted channel. *Implementation*: A. A qualified biologist will be present to ensure that state or federally listed fish and other aquatic vertebrates are not stranded during construction and implementation of channel dewatering. Prior to dewatering, the affected area will be surveyed by a qualified biologist, and if necessary, relocation procedures will be implemented to ensure that state and federally listed fish and other aquatic invertebrates are not adversely affected (outlined in BIO-8) B. Diverted and stored water will be protected from maintenance activity-related pollutants, such as soils or equipment lubricants or fuels. C. A multi-filter/screen system consisting of a 2.28 mm (3/32 inch) screen inside a 4x4x4 ft. box covered with 6.3 mm (¼ inch) screen will be installed at pump intakes to prevent impingement/entrainment of fish and amphibians.

Table 2-11: Proposed Project Environmental Commitments Table

Number	Title	Environmental Commitment Description
		D. If necessary, discharged water will pass over some form of energy dissipater to prevent erosion of the downstream channel. Silt bags will be equipped to the end of discharge hoses and pipes to remove sediment from discharged water. E. For full channel dewatering, filtration devices or settling basins will be provided as necessary to ensure that the turbidity of discharged water is not visibly more turbid than in the channel upstream of the maintenance site. If increases in turbidity are observed, additional measures will be implemented such as a larger settling basin or additional filtration. If increases in turbidity persist, the County's Project Manager will be alerted since turbidity measurements may be required. *Deconstruction*: A. When maintenance is completed, the flow diversion structure will be removed as soon as possible but no more than 48 hours after work is completed. Impounded water will be released at a reduced velocity to minimize erosion, turbidity, or harm to downstream habitat. Cofferdams will be removed such that surface elevations of water impounded above the cofferdam are lowered at a rate greater than one inch per hour. B. When diversion structures are removed, to the extent practicable, the ponded flows will be directed into the low-flow channel within the work site to minimize downstream water quality impacts. C. The area disturbed by flow bypass mechanisms will be restored at the completion of the project. This may include, but is not limited to, recontouring the area and planting of riparian vegetation.
EC-13GEN	Dewatering Pump/Generator Operations and Maintenance	When needed to assist in channel dewatering, pumps and generators will be maintained and operated in a manner that minimizes impacts to water quality and aquatic species. A. Pumps and generators will be maintained according to manufacturers' specifications to regulate flows to prevent dryback or washout conditions. B. Pumps will be operated and monitored to prevent low water conditions, which could pump muddy bottom water, or high water conditions, which creates ponding. C. A multi-filter/screen system consisting of a 2.28 mm (3/32 inch) screen inside a 4x4x4 ft. box covered with 6.3 mm (¼ inch) screen will be installed at pump intakes to prevent impingement/entrainment of fish and amphibians. D. Pumping machinery will be placed in a temporary containment structure (plastic basin, plastic-lined pit, etc.) designed to contain accidental hydrocarbon (gasoline, diesel, hydraulic fluid) spills.

Table 2-11: Proposed Project Environmental Commitments Table

Number	Title	Environmental Commitment Description
EC-14GEN	Planning for Pedestrians, Traffic Flow, and Safety Measures	A. Work will be staged and conducted in a manner that maintains two-way traffic flow on public roadways in the vicinity of the work site. If temporary lane closures are necessary, they will be coordinated with the appropriate jurisdictional agency and scheduled to occur outside of peak traffic hours (7:00 – 10:00 a.m. and 3:00 – 6:00 p.m.) to the maximum extent practicable. Any lane closures will include advance warning signage, a detour route and flaggers in both directions. When work is conducted on public roads and may have the potential to affect traffic flow, work will be coordinated with local emergency service providers as necessary to ensure that emergency vehicle access and response is not impeded. B. Bicycle and pedestrian facility closures will be scheduled outside of peak traffic hours (7:00 – 10:00 a.m. and 3:00 – 6:00 p.m.) to the maximum extent practicable. C. Public transit access and routes will be maintained in the vicinity of the work site. If public transit will be affected by temporary road closures and require detours, affected transit authorities will be consulted and kept informed of project activities. D. Adequate parking will be provided or designated public parking areas will be used for maintenance-related vehicles not in use through the maintenance period. E. Access to driveways and private roads will be maintained. If brief periods of maintenance would temporarily block access, property owners will be notified prior to maintenance activities.
EC-15GEN	Public Safety Measures	The County will implement public safety measures during construction as follows: A. Signs will be posted at job sites warning the public of construction work and to exercise caution. B. If needed, a lane will be temporarily closed to allow for trucks to pull into and out of access points to the work site. C. In areas accessible to the public, fencing, either the orange safety type or chain link will be installed around the perimeter of Project sites. D. When necessary, County or contracted staff will provide traffic control and site security.
EC-16GEN	Minimize Noise Disturbances to Residential Areas	The County will implement practices that minimize disturbances to residences and commercial winery facilities surrounding work sites. A. With the exception of emergencies, work will be conducted between the hours of 7:00 a.m. and 7:00 p.m., in accordance to Napa County Code Chapter 8.16. If project terrain or access road conditions require construction equipment to be staged, loaded, or unloaded off the project site (such as on a neighboring road or at the base of a hill), such activities shall only occur between the hours of 8:00 a.m. to 5:00 p.m. Maintenance activities in residential areas and near commercial winery facilities will not occur on Saturdays, Sundays, or County observed holidays except during emergencies, or with approval by the local jurisdiction and advance notification of surrounding residents.

Table 2-11: Proposed Project Environmental Commitments Table

Number	Title	Environmental Commitment Description
		B. Advanced notification will be provided 1 week prior to the start of construction to properties that have residences and/or commercial winery facilities (i.e., tasting room, sales room, restaurant, etc.) within 400 feet of a proposed construction site where heavy equipment will be used. C. Powered equipment (vehicles, heavy equipment, and hand equipment such as chainsaws) will be equipped with adequate mufflers. D. Excessive idling of vehicles will be prohibited beyond 5 minutes. E. Non-power hand tools will be maximized and noisy equipment will be minimized to the extent feasible at sites in close proximity to residential structures and commercial winery facilities (80 feet for wineries, 400 feet for residences). These include Sites 4, 7, 9, 15, 16, 17, 18, 19, and 20. F. Noise complaints will be responded to within 48 hours of receipt, and the County will make a good faith effort to resolve a noise sensitivity issue by constructing noise attenuation shielding or by another acceptable method, where appropriate.
EC-17GEN	Work Site Housekeeping	A. County employees and contractors will maintain the work site in neat and orderly conditions on a daily basis, and will leave the site in a neat, clean, and orderly condition when work is complete. Slash, sawdust, cuttings, etc. will be removed to clear the site of vegetation debris. As needed, paved access roads and trails will be swept and cleared of any residual vegetation or dirt resulting from the maintenance activity. All lunch trash will be properly disposed of. B. Materials or equipment left on the site overnight will be stored as inconspicuously as possible, and will be neatly arranged.

Table 2-11: Proposed Project Environmental Commitments Table

Number	Title	Environmental Commitment Description
Biological Resource Environmental Commitments These Environmental Commitments will be implemented as appropriate to avoid and minimize impacts on special-status species and other biological resources. These Environmental Commitments may be modified during project permitting and agency approvals of annual project activities.		
EC-18BIO	Minimize Impacts to Nesting Birds via Site Assessments, Surveys, and Avoidance Measures	A. For activities occurring between February 15 and August 15, Project areas will be surveyed by a qualified biologist, for nesting birds within 2 weeks prior to starting work. If a lapse in project-related work of 2 weeks or longer occurs, another focused survey will be conducted before project work can be reinitiated. B. In addition to the nesting bird survey discussed above, a Swainson's Hawk survey will be conducted in accordance with established CDFW protocols (e.g., CDFG 2000, or current guidance). Surveys will cover a minimum of a 0.5-mile radius around the construction area. C. If nesting birds are found, a buffer will be established around the nest and maintained until the young have fledged. Appropriate buffer widths are 0.25 miles for Swainson's Hawks and White-tailed Kite, 300 feet for non-listed raptors, 500 feet for listed passerines, and 150 feet for other birds nesting in trees, shrubs and structures. A qualified biologist may identify an alternative buffer based on a site specific-evaluation and in consultation with CDFW. Work will not commence within the buffer until fledglings are fully mobile and no longer reliant upon the nest or parental care for survival. D. If a Swainson's Hawk nest is present with a 0.5 mile radius of a Project site, and work will be conducted outside of the 0.25-mile buffer, a biologist will be onsite to monitor the nest for 3 day prior to construction and for the first 3 days of construction. The biologist would look for behavioral changes in Swainson's Hawk activity that would suggest the birds are stressed by construction activity or the nest may be abandoned. Such behaviors may include excessive vocalization, a startled response coincident with a loud noise or changes in the viewshed, or prolonged absence from the nest by adults. After the initial 3-day period, the biologist would visit the site to observe the nest every 3 days until the chick(s) has fledged. E. If a tree with an active Swainson's Hawk or White-tailed Kite nest is slated for removal, the County will implement Mitigation Measures BIO-2a and BIO-2b which require and assessment of the nest tree and development of a mitigation plan if removal is proposed. F. Hand-harvest of vegetation for salvage and other minor work that does not require mechanized equipment (e.g., surveying) may continue during the Swainson's Hawk nesting period throughout the Project Area, but not within 500 feet of the nest.
EC-19BIO	Avoid Impacts to Vernal Pool Fairy Shrimp	Prior to commencing construction, a qualified biologist will conduct a site assessment to determine if the work area has the potential to support vernal pool fairy shrimp. Any habitat with the potential to support vernal pool fairy shrimp would be avoided, and not directly or indirectly impacted by Project activities.

Table 2-11: Proposed Project Environmental Commitments Table

Number	Title	Environmental Commitment Description
EC-20BIO	Protection of Sensitive Fauna Species from Herbicide Use	A. Approved herbicides and adjuvants may be applied in habitat areas for sensitive wildlife species (including salmonids, foothill yellow-legged frog, California freshwater shrimp); all applications will occur in accordance with federal and state regulations. B. For sprayable or dust formulations: when the air is calm or moving away from sensitive wildlife habitat, applications will commence on the side nearest the habitat and proceed away from the habitat. When air currents are moving toward habitat, applications will not be made within 200 yards by air or 40 yards by ground upwind from occupied habitat. However, these distances may be modified for the control of invasive species if the following measures are implemented: i. A qualified biologist will determine presence/absence of sensitive resources in designated herbicide use areas and develop site-specific control methods (including the use of approved herbicide and surfactants). Proposed herbicide use would be limited to the aquatic formulation of glyphosate (Rodeo or equal). Surfactant would be limited to Agri-dex, Competitor, or another brand name using the same ingredients. ii. A qualified fisheries biologist will review proposed herbicide application methods and stream reaches. The fisheries biologist will conduct a pre-construction survey (and any other appropriate data research) to determine whether the proposed herbicide application is consistent with approvals concerning biological resources and determine which environmental protection measures will be instituted for work to proceed.
EC-21BIO	Avoid and Minimize Impacts to Special-Status Plant Species	A. Surveys of areas identified as suitable habitat for special-status plant species will be conducted by a qualified botanist prior to commencement of work. Surveys will be conducted during the appropriate time of the year to properly identify special-status plants. B. If special-status plants are detected within a construction area or within a 100-foot radius of the construction zone, the County will adjust the construction footprint or establish exclusion fencing to avoid impacts to the plants. Locations of special-status plant populations will be clearly identified in the field by staking, flagging, or fencing a minimum 100-foot wide buffer around them prior to the commencement of activities that may cause disturbance. No activity will occur within the buffer area. C. If avoidance is not feasible, then the County will implement measures to minimize the impact to the species. Minimization measures may include transplanting perennial species, seed collection and dispersal for annual species, and other conservation strategies that will protect the viability of the local population. If minimization measures are implemented, monitoring of plant populations will be conducted annually for 5 years to assess the mitigation's effectiveness. The performance standard for the mitigation will be no net reduction in the size or viability of the local population. D. No herbicides will be used in areas identified as potential habitat for special-status plants species, until a qualified botanist has surveyed the area and determined the locations of special-status plant species present. E. The County will not conduct activities that would result in the reduction of a plant species range or compromise the

Table 2-11: Proposed Project Environmental Commitments Table

Number	Title	Environmental Commitment Description
		viability of a local population.
EC-22BIO	Protection of Special-Status Amphibian and Reptile Species	A. Prior to commencing construction, a qualified biologist will conduct one daytime non-protocol level survey for special-status reptiles and amphibians including nests, eggs, and tadpoles. The survey will be conducted no more than 48 hours preceding the onset of construction. If no special-status amphibian or reptile is found within the activity area during the pre-activity survey, the work may proceed. B. If a special-status amphibian or reptile, or the eggs or larvae of a special-status amphibian or reptile, is found within the activity area during a pre-construction survey or during project activities, the following measures will be implemented: i. If eggs or tadpoles of a special-status species are found, a 100-ft buffer will be established around the location of the eggs/tadpoles and work may proceed outside of the buffer zone. Work within the buffer zone will be rescheduled until the time that eggs have hatched and/or tadpoles have metamorphosed. ii. If an active western pond turtle nest is detected within the activity area, a 100-ft buffer around the nest will be established and maintained. The buffer zone will remain in place until the young have left the nest, as determined by a qualified biologist. iii. If adults or juveniles of a special-status species are found, one of the following two procedures will be implemented: i. If, in the opinion of the qualified biologist, the individual is likely to leave the work area on its own volition, and work can be feasibly delayed, a buffer will be established around the location of the individual(s) and work may proceed outside of the buffer zone. No work will occur within the buffer zone until the individual has dispersed. ii. If, in the opinion of the qualified biologist, capture and removal of the individual to a safe place outside of the work area is likely to result in less impact than leaving the individual in place and delaying the work (e.g., if the species could potentially hide and be missed during a follow-up survey), the individual will be captured and relocated by a qualified biologist (with USFWS and/or CDFW approval, depending on the listing status of the species in question), and work may proceed. C. At the time of inspection, all instream exclosures and adjacent cover along isolated banks will be surveyed for the presence of special status amphibian and reptile species. A qualified biologist will implement measures under Section B (above) as necessary.
EC-23BIO	Protection of Bat Colonies	A. Within two weeks prior to the onset of work activities a qualified biologist will survey the project area to look for evidence of a bat use, including roost trees or structures. If evidence is observed, or if potential roost sites are present in areas where evidence of bat use might not be detectable (such as a tree cavity), an evening survey and/or nocturnal acoustic survey may be used to determine if the bat colony is active and to identify the specific location of the bat colony. B. If an active bat maternity colony is present then the qualified biologist will make the following determinations:

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Number	Title	Environmental Commitment Description
		i. Work can proceed without unduly disturbing the bat colony. ii. There is a need for a buffer zone to prevent disturbance to the bat colony, and implementation of the buffer zone will reduce or eliminate the disturbance to an acceptable level. iii. Work cannot proceed without unduly disturbing the bat colony; thus, the work will be postponed until after July 31. C. If a non-breeding bat hibernaculum is found in a tree or structure that must be removed or physically disturbed, the qualified biologist will notify CDFW prior to initiating any removal or exclusion activities. D. If roosts are determined to be present and must be removed, the bats will be excluded from the roosting site before the facility is removed. A mitigation program addressing compensation, exclusion methods, and roost removal procedures will be developed prior to implementation. Exclusion methods may include use of one-way doors at roost entrances (bats may leave, but not re-enter), or sealing roost entrances when the site can be confirmed to contain no bats. Exclusion efforts may be restricted during periods of sensitive activity (e.g., during hibernation or while females in maternity colonies are nursing young). E. If roosts cannot be avoided or it is determined that construction activities may cause roost abandonment, such activities may not commence until permanent, elevated bat houses have been installed outside of, but near the construction area. Placement and height will be determined by a qualified wildlife biologist, but the height of bat house will be at least 15 feet. Bat houses will be multi-chambered and be purchased or constructed in accordance with CDFW standards. The number of bat houses required will be dependent upon the size and number of colonies found, but at least one bat house will be installed for each pair of bats (if occurring individually), or of sufficient number to accommodate each colony of bats to be relocated.
EC-24BIO	Protection of Mammal Dens	A. No less than 5 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities, a qualified biologist will conduct a survey to determine if bobcat, coyote, gray fox, or mountain lion den sites are potentially present in the work area. If potential dens are found, they will be monitored for activity. If the biologist determines that dens may be active, the County will attempt to preserve the den and maintain an intact dispersal corridor between the den and undisturbed riparian habitat. B. If active dens cannot be avoided, the entrances of the dens will be blocked with soil, sticks, and debris for 3 to 5 days to discourage the use of these dens prior to project disturbance activities. The den entrances will be blocked to an incrementally greater degree over the three to five-day period. After the qualified biologist determines that animals have stopped using active dens, the dens will be hand-excavated with a shovel to prevent re-use during construction. No disturbance of active dens will take place when cubs may be present and dependent on parental care, as determined by a qualified biologist.

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Number	Title	Environmental Commitment Description
EC-25BIO	Protection of fish and other aquatic species during instream construction activities or channel dewatering	Before a work area is dewatered (as identified in EC-12GEN and EC-13GEN above) or instream construction activities commence, state and federally listed fish and aquatic invertebrates such as California freshwater shrimp will be captured and relocated to avoid injury and mortality and minimize disturbance. The following guidelines will apply. A. Prior to instream construction (i.e., placement of LWM, boulders, etc.), fish exclosures will be installed using silt fencing, silt curtain, block nets, or similar material to isolate the work area. For any areas to be dewatered, a coffer dam will be installed (see EC-12GEN and EC-13GEN). B. For projects that involve dewatering of the channel, downstream flows adequate to prevent fish or vertebrate stranding will be maintained at all times during dewatering activities. Pump intakes will be covered by 2.28 mm (3/32 inch) mesh and placed inside a 4x4x4 ft box covered with 6.3 mm (¼ inch) screen to prevent entrainment of fish and amphibians, and will be checked periodically for impingement of fish and amphibians. C. Before instream construction commences or a work area is dewatered, the affected area will be surveyed by a qualified fisheries biologist who has a current CDFW scientific collecting permit and USFWS recovery permit and is experienced with capture and handling protocols for state or federally listed fish and aquatic invertebrates, including California freshwater shrimp. Any state and federally listed fish and aquatic invertebrates such as California freshwater shrimp that are encountered will be captured and relocated to avoid injury and mortality and minimize disturbance. D. For sites that will be dewatered, the channel will be blocked by placing fine-meshed nets or screens above and below the work area to prevent state or federally listed fish and aquatic invertebrates such as California freshwater shrimp from reentering the work area. To minimize entanglement, mesh diameter will not exceed 1/8 inch. The bottom edge of the net or screen will be secured to the channel bed to prevent fish from passing under the screen. Exclusion screening will be placed in low velocity areas to minimize impingement. Screens will be checked periodically and cleaned of debris to permit free flow of water. E. Before removal and relocation begins, a qualified fisheries biologist will identify the most appropriate release location(s). Release locations should have water temperatures similar to (<2°C difference) the capture location and offer ample habitat (e.g., depth, velocity, cover, connectivity) for released fish and aquatic invertebrates, and should be selected to minimize the likelihood of reentering the work area or becoming impinged on exclusion nets or screens. F. The means of capture will depend on the nature of the work site, and will be selected by a qualified fisheries biologist. Complex stream habitat may require the use of electrofishing equipment, whereas in outlet pools, aquatic vertebrates and invertebrates may be captured by pumping down the pool and then seining or dipnetting. Electrofishing will be used only as a last resort; if electrofishing is necessary, it will be conducted only by properly trained personnel following the NMFS Guidelines dated June 2000. G. When feasible, initial fish relocation efforts will be performed several days prior to the scheduled start of construction. To the extent feasible, dewatering and species relocation will be performed during morning periods. The fisheries biologist will survey the exclosures or cofferdams throughout the dewatering effort to verify that no

Table 2-11: Proposed Project Environmental Commitments Table

Number	Title	Environmental Commitment Description
		state or federally listed fish or aquatic invertebrates are present. Afternoon pumping activities should generally not occur and pumping should be limited to days when ambient air temperatures are not expected to be high. Air and water temperatures will be measured periodically, and dewatering and species relocation activities will be suspended if temperatures exceed the limits allowed by NMFS guidelines. H. Handling of fish and aquatic invertebrates will be minimized. When handling is necessary, personnel will wet hands or nets before touching them. I. Prior to translocation, any state or federally listed species that are collected during surveys will be temporarily held in cool, aerated, shaded water using a 5-gal container with a lid. Overcrowding in containers will be avoided; at least two containers will be used and no more than 25 fish will be kept in each bucket. Aeration will be provided with a battery-powered external bubbler. Fish will be protected from jostling and noise, and will not be removed from the container until the time of release. A thermometer will be placed in each holding container and partial water changes will be conducted as necessary to maintain a stable water temperature. Special-status fish and other special-status aquatic species such as California freshwater shrimp will not be held more than 30 minutes. If water temperature reaches or exceeds NMFS limits, the fish and other aquatic species will be released and relocation operations will cease. J. If state or federally listed fish or aquatic invertebrates are abundant, capture will cease periodically to allow release and minimize the time fish spend in holding containers. K. Fish and aquatic invertebrates will not be anesthetized or measured. However, they will be visually identified to species level, and year classes will be estimated and recorded. L. Reports on fish relocation activities will be submitted to CDFW, USFWS, and NMFS in a timely fashion. M. If mortality during relocation exceeds 5%, relocation will cease and CDFW, USFWS, and NMFS will be contacted immediately or as soon as feasible. N. Relocation sites for any captured California freshwater shrimp will be identified prior to initiating removal activities.
Geology and Soils Environmental Commitments These Environmental Commitments will be implemented by the County and its Contractors, as appropriate, for all activities associated with the Proposed Project.		
EC-26GEO	Berm Configuration	A. All berms will include a core with a minimum crest width of 20 feet and a river-side slope inclination of 3:1 (horizontal to vertical) or flatter, and a land-side slope inclination of 2:1 or flatter. B. The land-side slope will have a plantable shoulder inclined at 8:1 or flatter. C. The toe of the new berm will be set back at least 12 feet from the adjacent river-side cut slope.
EC-27GEO	Site Preparation	A. Prior to the start of work, the contractor will locate and mark all active subsurface utilities in the general vicinity of the site. The contractor will protect all utilities that are to remain in and surrounding the site (including existing piezometers) during onsite excavation and construction activities. Existing piezometers to be demolished or abandoned will need to done in a manner consistent with local regulations.

		B. The site will then be cleared and grubbed of surface and subsurface deleterious matter including vegetation, aggregate road-base material and abandoned utilities. These materials will be removed from the site or stockpiled for reuse if approved by the owner in consultation with a qualified geotechnical engineer or geologist. Depressions resulting from the removal of underground obstructions (including tree stumps and root balls) that extend below the proposed finished grades will be cleared and the depressions backfilled with suitable material compacted to the requirements given in EC-28GEO. C. Special attention will be given to site preparation in areas where new berms are planned. Within berm areas, a qualified geotechnical engineer or geologist will observe exposed conditions after vegetation and organic-laden soils are removed but prior to any fill placement to: 1) verify the adequacy of stripping; 2) check that suitable soils are exposed. Soils that are loose, weak, highly permeable or otherwise unsuitable will be over excavated under the engineer's direct observation and replaced with engineered material appropriate for berm construction.
EC-28GEO	Fill Materials	A. All proposed fill materials will be approved by a qualified geotechnical engineer or geologist prior to use. The materials excavated from excavated sites may be suitable for re-use as fill, from a geotechnical standpoint, if they meet or can be processed (i.e., by crushing and/or blending) to meet the requirements presented in this section. Material that cannot be mixed or processed to meet specification requirements should be disposed of offsite or stockpiled for other uses at the discretion of the owner. If the re-use of aggregate base or gravel is to be considered, it must first be approved by the owner in consultation with a qualified geotechnical engineer or geologist. B. General Fill: On-site native soil can be used as General Fill, provided it conforms to the requirements presented below: i. Has an organic content of less than 3 percent by volume, ii. Does not contain rocks or lumps larger than 4 inches in greatest dimension, and iii. Has no more than 15 percent of material larger than 2.5 inches. General Fill can be used as engineered fill/backfill except where Berm Core Fill is required. C. Berm Core Fill: In addition to the requirements for General Fill, Berm Core Fill will classify as Clay based on Unified Soil Classification System (USCS) criteria, have a Plasticity Index between 12 and 35 and have a Liquid Limit no greater than 55. If sands are mixed with clay to create Berm Core Fill, such mixtures will be blended and thoroughly mixed in a borrow area and be evaluated and approved by a qualified geotechnical engineer prior to its importation to the site. Blending in a fill area is not acceptable. D. Offsite fill material (if used) will comply with the requirements appropriate its intended use and be evaluated and approved by a qualified geotechnical engineer or geologist.
EC-29GEO	Fill Placement	<u>Subgrade Preparation</u> A. Subgrade surfaces in areas to receive fill will be firm, unyielding, and compacted to the requirements for engineered fill (below). Soft, yielding or otherwise unsuitable subgrade soils will be over-excavated to expose firm non-yielding materials and replaced with appropriately engineered fill. Additional requirements

		for the preparation of areas to receive fill are presented EC-27GEO, Site Preparation. B. Immediately prior to fill placement, exposed subgrade soils will be scarified to a depth of 6 inches or the full depth of any existing shrinkage cracks. The scarified subgrade soils will then be moisture conditioned to slightly above optimum water content and compacted to at least 90 percent relative compaction based on the ASTM D-1557 test method (latest version). A qualified geotechnical engineer or geologist will observe and test, as appropriate, during subgrade preparation to check that surfaces to receive fill are properly prepared and verify that specified compaction and moisture conditioning requirements are achieved. <u>Engineered Fill Placement</u> A. All fill will be spread in lifts not exceeding 8 inches in uncompacted thickness on surfaces that are approximately level, moisture conditioned, as appropriate, and compacted by mechanical means to the required levels of compaction). It is possible that fill and/or subgrade soils may be excessively wet or dry depending on the moisture content at the time of construction. If the fill soils are too wet, they may be dried by aeration or by mixing with drier materials. If the fill soils are too dry, water will need to be added. B. Required levels of compaction will be as follows (all per ASTM D-1557, latest version): i. Berm Core: at least 90 percent relative compaction ii. Plantable Shoulder: at least 85 percent relative compaction iii. Roadway Aggregate Base and/or Gravel: at least 95 percent relative compaction iv. Other Fill Areas: at least 90 percent relative compaction C. A qualified geotechnical engineer or geologist will observe and test, as appropriate, during fill placement to verify that specified compaction and moisture conditioning requirements are achieved. D. Berm Core Fill will be moisture conditioned to about 2 or 3 percent over optimum, as determined by ASTM D-1557 (latest version). Materials comprising the berm core will be approximately uniform and the placement adjacent dissimilar materials will be avoided. The berm core will be compacted in a systematic manner using a sheepsfoot kneading compactor or equivalent equipment. Material that fails the moisture or compaction criteria will be loosened by ripping or scarifying, moisture conditioned, and then recompacted.
EC-30GEO	Berm Surface Drainage	Positive surface drainage will be provided to direct surface water away from slopes. Ponding or collection of surface water will be avoided in any areas adjacent to slopes. The river side of the berm will be designed to sheet flow to and beyond the berm toe. The crest of the berm will either be crowned to split the sheet flow runoff to both side of the berm or the crown will be graded for sheet flow toward the vineyards. Grading plans will account for the swale that will be formed at the toe of the vineyard side of the slope and grade it to drain.
EC-31GEO	Berm Maintenance	Annual inspection and maintenance of constructed berms will be performed late summer to early fall. The berm will be mowed prior to inspection to facilitate observation and repair. Trees or shrubs will not be allowed to grow on the berm and shrubs and saplings will be removed from the crest and river-side slope of the berm. Rodent activity will be monitored and population control initiated where rodent infestation is observed. Berm damage from tree or shrub removal, erosion, scour, rodent activity, etc. will be repaired to maintain the integrity of the berm.

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Chapter 3
ENVIRONMENTAL CHECKLIST

1. Project Title:	Napa River Restoration: Oakville to Oak Knoll Project
2. Lead Agency Name and Address:	Napa County Planning, Building, and Environmental Services Department 1195 Third Street, Suite 210 Napa, CA 94559
3. Contact Person, Phone Number and Email:	Brian Bordona Supervising Planner (707) 259-5935 Brian.Bordona@countyofnapa.org
4. Project Location and APN:	Countywide
5. Property Owner:	Various (see Project Description)
6. General Plan Designation:	Various (see Project Description)
7. Zoning:	Various (see Project Description)
8. Description of Project:	See Project Description
9. Surrounding Land Uses and Setting:	Vineyard, Open Space, Residential
10. Other Public Agencies whose Approval or Input May Be Needed:	▪ California Department of Fish and Wildlife ▪ California State Historic Preservation Office ▪ National Marine Fisheries Service ▪ Regional Water Quality Control Board (San Francisco Bay Region) ▪ United States Army Corps of Engineers ▪ United States Fish and Wildlife Service

This chapter of the IS/MND assesses the Proposed Project's environmental impacts based on the environmental checklist provided in Appendix C of Napa County's Local Procedures for Implementing the California Environmental Quality Act (Napa County Conservation, Development & Planning Department 2010) as well as Appendix G of the state's CEQA Guidelines. The environmental resources and potential environmental impacts of the Proposed Project are described in the individual subsections below. Each section (3.1 through 3.18) provides a brief overview of existing environmental conditions for each resource topic to help the reader understand the conditions that could be affected by the Proposed Project. In addition, each section includes a discussion of the rationale used to determine the significance level of the Project's environmental impact for each checklist question.

The primary sources of information for the setting sections below are derived from the County's 2008 General Plan and the 2005 Napa County Baseline Data Report (Napa County BDR or BDR). The Napa County BDR was developed to provide a baseline of existing condition information for a wide range of environmental and resource topics in Napa County. Initially developed to support the update of the Napa County General Plan, the BDR continues to provide environmental setting information for use in environmental compliance, permitting, and planning projects in Napa County. According to Section 15150 of the CEQA Guidelines, a lead agency may incorporate all or portions of another environmental document available to the public to avoid redundancy in the environmental review process. Applicable sections from the County General Plan and BDR have been summarized and incorporated into this IS/MND. These documents are available for review at the Napa County Planning Division office.

In addition to these primary sources of setting information, other resources reviewed for relevant information are included and cited as applicable.

3.I AESTHETICS

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
	Would the project:				
a.	Have a substantial adverse effect on a scenic vista?	☐	☒	☐	☐
b.	Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☒	☐	☐
c.	Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☒	☐	☐
d.	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

Environmental Setting

Napa County's rural nature, wine and grape heritage, and unique geography contribute to its rustic charm and distinctive character which sets it apart from other Bay Area locations. Its combination of rural development, distinguished vineyards, and premier culinary institutions make it one of the nation's top tourist destinations, in part owing to the distinct aesthetic environment created by these features.

The Napa County General Plan (Napa County 2008) identifies aesthetics as one of the important factors contributing to the County's "community character," and includes goals and policies that bear directly on the preservation of aesthetic character and visual resources. Consistent with the General Plan emphasis on aesthetic values, the County's Viewshed Protection Ordinance defines standards and creates guidelines for grading and construction in hillside areas, with the specific aim of protecting views from scenic roadways. Additional General Plan goals and policies protect land uses such as agriculture and open space that contribute to the County's aesthetic character; protect cultural and historic resources, many of which are aesthetically as well as culturally valuable; and provide guidance for preserving dark sky values in rural areas.

Visual Character

Much of the following is an abbreviated discussion of the relevant information contained in the Visual and Aesthetic Resources chapter of the Napa County Baseline Data Report (BDR) (Napa County 2005).

The mountains of the scenic California Coastal Range surround the County to the east, north, and west, and run through the County. San Pablo Bay, a segment of the San Francisco Bay, lies at the southern boundary of the County. The mountainous ridgelines that frame the County's eastern and western boundaries provide visually distinct valley regions. The visual character of these mountain areas varies; some are densely forested with evergreen trees, while others are open grasslands dominated by mature oak trees.

The Napa Valley is a central narrow valley which extends from just south of the City of Napa to near the County's northwestern border with Sonoma County. Agriculture is the dominant land cover in the valley, with vineyards and other agricultural uses occupying more than half of the land on the valley floor. These agricultural uses, combined with areas of natural vegetation, give the valley its characteristic natural Mediterranean, yet managed, appearance. In general, transitions between land uses along the valley floor are gradual and smooth.

Urbanization in the Project Area is concentrated in the Town of Yountville. However, the Project Area primarily consists of semi-rural residences with little visual delineation between city and farmland. The natural environment – streams, mature valley oak stands, and riparian areas – serve as buffers between residences and agricultural uses in many locations, further blending the appearance of diverse land uses.

Typical of the Napa Valley floor, the Oakville to Oak Knoll Reach is located in a rural area dominated by agricultural land uses, primarily vineyards with single family homes. As a result, most viewers are drivers on area roadways, who see the project reach at a distance, as a component of a broader landscape. Viewed from this perspective, the project reach appears primarily as a thickly vegetated corridor forming a middle-ground backdrop to vineyards. A limited number of viewers (vineyard property owners and their employees and guests) experience the project reach from a closer perspective, where it assumes more visual dominance, and individual details of the riparian corridor—structure and species composition—become more important. For these viewer groups, the project reach is an important component of the scenic rural/agricultural landscapes that are recognized by the County as a key aspect of the County's character and appeal (Napa County 2008).

Other than road crossings, there is no public access to the Napa River within the Project Area.

Scenic Highways

The County General Plan identifies over 280 miles of County-designated scenic roadways; however, none have been officially designated as Scenic Highways by the State of California. Although several segments of Highway 29 are eligible for state designation, the County has not pursued inclusion in the State Scenic Highway Program at this time. Instead, the General Plan has an adopted a Viewshed Protection Program which contains polices aimed at protecting the County-designated scenic roadways. These policies are primarily focused on ensuring aesthetic compatibility of new development or infrastructure constructed along these sensitive corridors. In the Project Area, Highway 29, Silverado Trail, Yountville Cross Road, and Oak Knoll Avenue, are County-designated scenic roads subject to the Napa County Viewshed Protection Program.

Viewer Groups

All of the land on both sides of the Napa River in the Proposed Project is privately-owned land. Viewer groups may include residents, workers, and motorists, depending on vegetation density. Single-family residential homes are located adjacent to the Napa River particularly near Project Sites 15 – 20. For viewers who experience the project reach from a close perspective, viewer sensitivity can be moderately high because they are more likely to value the natural environment, appreciate the visual experience, and be more sensitive to changes in views or incompatible elements. Groups who view the project reach from a distance or for short duration (i.e. motorists) experience more moderate viewer sensitivity because they are generally not highly focused on details of the river. Rather, the thickly vegetated features of the river appear as a backdrop to the overall visual surroundings.

Discussion of Checklist Responses

a. Adverse Effects on Scenic Vistas — *Less than Significant with Mitigation*

The Project Area does not contain any specifically designated scenic vistas. However, the County General Plan repeatedly identifies scenic beauty as one of the County's most important and characteristic attributes. Therefore, this analysis treats all vistas in the Project Area as scenic vistas.

Temporary Effects

Project construction would result in some visual disruption related to vegetation and tree removal, earthwork, and staging, including equipment parking, stockpiles of excavated materials, etc. Because the aim of the project is to maximize habitat value, vegetation removal would be restricted to the minimum required to allow earthwork to proceed, and earthwork would be restricted to the minimum necessary for project success. Much of the area slated for reconfiguration is currently subject to bank failure; some vegetation and trees in these areas are already downed as a result of natural processes, and more remains at risk. In addition, construction would be phased over a period of about 5 years, so at any given time the extent of visibly disturbed areas would be limited, and would be substantially less than the total project footprint. Moreover, the majority of the areas proposed for restoration are located at some distance from public-access roadways, so the visibility of disturbed areas by the general public would be quite limited. Nonetheless, because of the importance of visual quality as an aspect of Napa County's unique character, impacts could be significant.

Immediately post-construction, restored areas would still appear somewhat "unfinished" until vegetation fully re-establishes. However, the disturbed appearance associated with construction would not persist, and revegetation in riparian areas would use fast-growing native species such as willows. As a result, creekside work areas are expected to recover to a point where they are no longer conspicuous within about 2 years following construction. Moreover, because work would be phased, some work areas would be substantially recovered by the time ground is broken on the final sites; at any given time, the area in visual recovery would be substantially less than the total project footprint. Because of their comparatively short duration and the limited extent of disturbance at any given time, short-term post-construction visual impacts of earthwork and riparian restoration are expected to be less than significant.

Long-term Effects

Over the long-term, the appearance of the restored riparian corridor and river channel are expected to be highly natural, and as such, consistent both with adjacent river reaches, and with the overall mosaic of natural, agricultural, and built views that characterizes the Napa Valley floor. Intermittent maintenance activities (vegetation and bank management) could result in some visual disturbance associated with the presence of personnel and heavy equipment, but the duration and extent of disturbance would be limited, and would not be out of character with ongoing activities on nearby agricultural lands. Lasting changes in the appearance of the river corridor as a result of maintenance could include slight alterations in channel appearance as a result of bank stabilization, tree removal, and localized vegetation management. However, all maintenance undertakings would be designed and implemented to ensure riparian corridor functioning and maximize the natural appearance of the river corridor. Consequently, to the extent that the restored riparian corridor can be seen by the public, most viewers are expected to consider the changes positive. Long-term visual changes associated with the Proposed Project would thus represent a less than significant impact, and many viewers are expected to consider them beneficial overall.

Conclusion

As described above, impacts to aesthetics during construction of the Proposed Project could be significant. Implementation of Mitigation Measure AES-1 would reduce the temporary visual impacts of project construction to less than significant. Any long-term residual impact is considered less than significant.

Mitigation Measure AES-1: Implement Construction Site Housekeeping Measures and Designate Visual Disturbance Coordinator

In order to avoid or reduce adverse effects related to vegetation removal, earthwork, construction staging, and other project activities and needs, the County will require all contractors employed on the project to implement the following measures at all construction sites.

- Project work and staging areas will be maintained in a clean, orderly condition at all times.
- Equipment and materials will be stored in construction staging areas and/or away from public view. To the extent feasible, staging areas will be located away from public view.
- Debris such as excavation spoils and downed vegetation not slated for onsite reuse will be stored away from public view or removed promptly at regular 1-week intervals.

The County will prepare informational signage for the Proposed Project, including the name and contact information for a County staff person serving as the designated visual disturbance coordinator. This person, who may be the same staff member designated as noise coordinator, will be responsible for responding to public complaints regarding construction visual disturbance. S/he will be available during regular business hours to monitor and respond to concerns. In the event a visual disturbance complaint is received, s/he will be responsible for determining the cause of the complaint and ensuring that all reasonable measures are implemented to correct the problem.

b. Damage to Scenic Resources along a Scenic Corridor — *Less than Significant with Mitigation*

Several of the roadways in the Project Area are County-designated scenic routes, and, as discussed above, most of the public would be able to see the restoration sites only from public roadways. Consequently, impacts identified in (a) above for scenic vistas in general would also apply to views from scenic highways and other scenic routes. To summarize, visual impacts of construction disturbance could be significant, but would be reduced to the extent feasible by implementation of Mitigation Measure AES-1 above. Permanent impacts would be less than significant, as discussed above, and many viewers are expected to consider the long-term visual outcomes of the project beneficial. No additional mitigation is required.

Mitigation Measure AES-1: Implement Construction Site Housekeeping Measures and Designate Visual Disturbance Coordinator
See text of measure AES-1 under (a)

c. Changes to Existing Visual Character or Quality — *Less than Significant with Mitigation*

As identified above, the Project Area does not contain any specifically designated scenic vistas, but this analysis treated all views in the Project Area as scenic vistas with particular importance to the County's community character and quality of life. As a result, the discussion presented in (a) above for scenic vistas also applies to general changes in the visual character of the work sites and their surroundings. To summarize, visual impacts of construction disturbance could be significant, but would be reduced to the extent feasible by implementation of Mitigation Measure AES-1 above. Long-term impacts would be less than significant, as discussed above, and many viewers are expected to consider the permanent visual outcomes of the project beneficial. No additional mitigation is required.

Mitigation Measure AES-1: Implement Construction Site Housekeeping Measures and Designate Visual Disturbance Coordinator
See text of measure AES-1 under (a)

c. New Sources of Light or Glare — *No Impact*

The Proposed Project does not include any facilities that would require new or modified sources of lighting, and project construction would use natural materials and thus would not introduce new or substantially modified sources of glare. Project construction would be conducted during daylight hours only, thus no nighttime lighting would be needed. Consequently, there would be no impact and no mitigation is required.

3.2 AGRICULTURAL RESOURCES

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation (DOC) as an optional model to use in assessing impacts on agriculture and farmland. Would the Project:					
a.	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program (FMMP) of the California Resources Agency, to nonagricultural use?	☐	☐	☒	☐
b.	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c.	Involve other changes in the existing environment that, because of their location or nature, could result in a conversion of Farmland to a non-agricultural use?	☐	☐	☐	☒

Environmental Setting

California laws establish several mechanisms that protect agriculture and agricultural lands, including the California Land Preservation Act (Williamson Act) process and the California Department of Conservation's (DOC's) Farmland Mapping and Monitoring Program (FMMP). The Napa County General Plan envisions agriculture as the "primary land use" in the County "well into the future" (Napa County 2008), and includes a number of goals and supporting policies to preserve the County's agricultural land uses.

The preservation of the County's agricultural land has long been at the forefront of the County's planning approach, and is critically important to the overall character and economic viability of Napa County. Agriculture, especially winegrape production, remains the County's top industry (Napa County 2013). In 2012, the gross value of winegrape production was $656,236,100 – an increase of $232,794,200 or almost 55% greater than 2011. This increase was primarily due to the increase in winegrape production and relatively stable prices paid for the Napa County winegrape crop. Production of all other agricultural products remained stable with slight to moderate increases compared to previous years. The total value of all agricultural production in 2012 was $665,298,100.

As of 2010, the County consists of the following agricultural land uses:

Table 3.2-1. Napa County Agricultural Land Uses

Land Use Category	Total Acres
Prime Farmland	31,621
Farmland of Statewide Importance	9,711
Unique Farmland	16,414
Farmland of Local Importance	18,464
Grazing Land	179,029

Source: DOC 2011

Consistent with the County's dedication to agricultural land preservation, there has been a zero net change in total farmland acreage from 2008-2010 (DOC 2011). According to DOC, there are currently 70,614 acres of agricultural lands in Napa County under a Williamson Act Contract (DOC 2010). These lands are protected from conversion to non-agricultural uses for the duration of the contract (usually 10 years).

The Napa County General Plan contains two land use designations for agricultural uses:

- Agriculture, Watershed and Open Space, and
- Agricultural Resource.

The Proposed Project is located in an area designated Agricultural Resource (AR). This designation is used to identify valley and foothill areas of the County where agriculture is currently, and should continue to be, a predominant land use. Permissible land uses are the same as those for the Agriculture, Watershed and Open Space designation. Incompatible uses, including urbanized uses—are to be precluded in AR areas. The minimum parcel size for the AR designation is 40 acres, with a maximum of one single family residential unit per parcel.

The Napa County Zoning Ordinance Title 18 provides three agricultural zoning designations: Agricultural Watershed (AW), Agricultural Preserve (AP), and Agricultural Combination (A) District. The project reaches are in an area zoned AP. Similar to the land use designation discussed above, this zoning classification is applied to the County's fertile valley and foothill areas, where agricultural activities are currently taking place and should continue to be the predominant land use, where uses incompatible to agriculture should be precluded, and where the development of urban uses would be detrimental to the continuance of agriculture and the maintenance of open space.

Land use planning in the Project Area is governed by the Napa County General Plan and Zoning Ordinance. As identified above, the project reaches are designated as AR lands in the General Plan (Napa County 2008) and are zoned AP. They include lands classified as Prime Farmland, Unique Farmland, and Other Land by the FMMP. About nine parcels in the Project Area are currently enrolled as Prime Farmland under the Williamson Act (DOC 2013).

Discussion of Checklist Responses

a. Conversion of Important Farmland — *Less than Significant*

Some of the Project Area is classified as Important Farmland, and additional areas are considered Unique Farmland by the State of California. Conversion of Important or Unique Farmlands to nonagricultural uses commonly represents a significant impact. However, the Proposed Project focuses exclusively on river restoration, and although it would remove a very small area from active cultivation, it would not alter land use designations or farmland classifications at either the local or state level, nor would it create pressure for further conversion of agricultural lands. All project-related activities would be confined to the corridor immediately along the Napa River. In total, a narrow strip of approximately 36 acres of land currently in vineyards and related uses would be converted to riparian corridor and floodplain terraces. The Proposed Project would not decrease the value of adjacent lands as an agricultural resource, and would likely create a long-term benefit to agriculture by managing Napa River flooding more effectively and removing plant hosts for Pierce's disease. In light of all these factors, impacts related to conversion of agricultural lands are considered less than significant, and no mitigation is required.

b. Conflict with Existing Zoning or Williamson Act— *No Impact*

The Project Area is designated as AR lands in the Napa County General Plan (Napa County 2008) and is zoned AP. As discussed above, the AR designation identifies areas where agriculture is prioritized. AP zoning is applied in areas where agricultural activities are currently taking place and should continue to be the predominant land use, with open space maintained and incompatible land uses precluded. The Proposed Project focuses exclusively on river restoration, and thus is consistent with the open space character of both the AR designation and AP zoning. The Project would not require removal of any Williamson Act lands from contract. Consequently, there would be no conflict with existing land use designations, zoning, or Williamson Act contracts. No mitigation is required.

c. Other Changes That Could Convert Farmland—*No Impact*

As identified in (a) and (b) above, the Proposed Project focuses exclusively on river restoration along the present course of the Napa River, and would not materially alter the existing land use mosaic on the Napa Valley floor. Rather, it would enhance the Valley's existing rural character and contribute to the stability of agricultural uses by improving flood management. Since the Project would not alter the Valley's land use mosaic, there would be no pressure toward farmland conversion as a result of the Project, and no impact related to enabled or accelerated farmland conversion. No mitigation is required.

3.3 AIR QUALITY

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
When available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:					
a.	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b.	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c.	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d.	Expose sensitive receptors to substantial pollutant concentrations?	☐	☒	☐	☐
e.	Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

Regulatory Setting

The Clean Air Act is implemented by the U.S. Environmental Protection Agency (USEPA) and sets ambient air limits, the National Ambient Air Quality Standards (NAAQS), for six criteria pollutants: particulate matter, carbon monoxide (CO), nitrogen oxides (NOx), ground-level ozone and lead. Of these criteria pollutants, particulate matter and ground-level ozone pose the greatest threat to human health. The California Air Resources Board (CARB) sets standards for criteria pollutants that are more stringent than NAAQS, and includes the following additional contaminants: visibility reducing particles, sulfates, and vinyl chloride. The Proposed Project is located within the San Francisco Bay Area Air Basin (SFBAAB), which includes all or portions of the nine-county Bay Area. The Bay Area Air Quality Management District (BAAQMD) manages air quality within the SFBAAB for attainment and permitting purposes. **Table 3.3-1** shows the current Bay Area attainment status for the state and federal ambient air quality standards.

Table 3.3-1. Bay Area Attainment Status of the State and Federal Ambient Air Quality Standards

Contaminant	Averaging Time	State Standards Attainment Status[1]	Federal Standards Attainment Status[2]
Ozone	8-hour	N[9]	N[4]
	1-hour	N	See footnote 5
Carbon Monoxide	8-hour	A	A[6]
	1-hour	A	A
Nitrogen Dioxide	1-hour	A	U
	Annual arithmetic mean		A
Sulfur Dioxide (See footnote 12)	24-hour	A	A
	1-hour	A	A
	Annual arithmetic mean		A
Particulate Matter (PM_{10})	Annual arithmetic mean	N[7]	
	24-hour	N	U
Fine Particulate Matter ($PM_{2.5}$)	Annual arithmetic mean	N[7]	A
	24-hour		N
Sulfates	24-hour	A	
Lead (See footnote 13)	30-day average		A
	Calendar quarter		A
	Rolling 3-month average		See footnote 14
Hydrogen Sulfide	1-hour	U	
Vinyl Chloride (chloroethene)	24-hour	No information available	
Visibility Reducing Particles	8 hour (10:00 to 18:00 PST)	U	

A – attainment
N – non-attainment
U – unclassified
Notes:

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter - PM10, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, Lake Tahoe carbon monoxide, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for lead and the PM10 annual standard), then some measurements may be excluded. In particular, measurements are excluded that ARB determines would occur less than once per year on the average. The Lake Tahoe CO standard is 6.0 ppm, a level one-half the national standard and two-thirds the state standard.
2. National standards shown are the "primary standards" designed to protect public health. National standards other than for ozone, particulates and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the 4th highest daily concentrations is 0.075 ppm (75 ppb) or less. The 24-hour PM10 standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 µg/m3. The 24-hour PM2.5 standard is attained when the 3-year average of 98th percentiles is less than 35 µg/m3. Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM10 is met if the 3-year average falls below the standard at every site. The annual PM2.5 standard is met if the 3-year average of annual averages spatially-averaged across officially designed clusters of sites falls below the standard.
3. National air quality standards are set by US EPA at levels determined to be protective of public health with an adequate margin of safety.
4. Final designations effective July 20, 2012.

Contaminant	Averaging Time	State Standards Attainment Status[1]	Federal Standards Attainment Status[2]

5. The national 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005.
6. In April 1998, the Bay Area was redesignated to attainment for the national 8-hour carbon monoxide standard.
7. In June 2002, CARB established new annual standards for PM2.5 and PM10.
8. Statewide VRP Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.
9. The 8-hour CA ozone standard was approved by the Air Resources Board on April 28, 2005 and became effective on May 17, 2006.
10. U.S EPA lowered the 24-hour PM2.5 standard from 65 µg/m^3 to 35 µg/m^3 in 2006. EPA designated the Bay Area as nonattainment of the PM2.5 standard on October 8, 2009. The effective date of the designation is December 14, 2009 and the Air District has three years to develop a plan, called a State Implementation Plan (SIP) that demonstrates the Bay Area will achieve the revised standard by December 14, 2014. The SIP for the new PM2.5 standard must be submitted to the US EPA by December 14, 2012.
11. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100ppm (effective January 22, 2010).
12. On June 2, 2010, the U.S. EPA established a new 1-hour SO2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The existing 0.030 ppm annual and 0.14 ppm 24-hour SO2 NAAQS however must continue to be used until one year following U.S. EPA initial designations of the new 1-hour SO2 NAAQS. EPA expects to designate areas by June 2012.
13. ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure below which there are no adverse health effects determined.
14. National lead standard, rolling 3-month average: final rule signed October 15, 2008. Final designations effective December 31, 2011.

Source: BAAQMD 2013

BAAQMD adopted the Bay Area Clean Air Plan (Bay Area CAP) in 2010 to provide a plan to improve Bay Area air quality and meet public health goals. More specifically, the control strategy described in the Bay Area CAP is designed to reduce emissions and decrease ambient concentrations of harmful pollutants, and safeguard public health by reducing exposure to air pollutants that pose the greatest health risk.

The Bay Area CAP addresses four categories of pollutants: (1) ground level ozone and its key precursors, reactive organic gases (ROG) and NOx; (2) particulate matter, primarily particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), as well as precursors to secondary $PM_{2.5}$; (3) air toxics; and (4) GHGs. The control strategy in the Bay Area CAP describes stationary source measures, transportation control measures, mobile source measures, land use and local impact measures, energy and climate measures, and further study measures to reduce air pollutants (BAAQMD 2010a).

BAAQMD adopted the Bay Area Ozone Attainment Plan in 2001 in response to EPA's finding of failure of the Bay Area to attain the national ambient air quality standard for ozone. The Plan includes a control strategy for ozone and its precursors to ensure reduction in emissions from stationary sources, mobile sources, and the transportation sector.

The BAAQMD Bay Area 2005 Ozone Strategy charts a course for future actions to further reduce ozone levels in the Bay Area. The control strategy outlines a set of control measures to further reduce ozone precursor emissions in order to reduce ozone levels in the Bay Area

and to reduce transport of pollution to downwind regions. The control strategy includes stationary source measures, mobile source measures, and transportation control measures.

The Napa County General Plan (Napa County 2008) includes policies to reduce air pollution by achieving and maintaining air quality in Napa County that meets or exceeds state and federal standards.

The BAAQMD has developed CEQA guidelines to assist local jurisdictions in evaluating potentially adverse impacts on air quality. The thresholds of significance in the 2010 CEQA guidelines were affirmed by the California Court of Appeal on August 13, 2013. **Table 3.3-2** presents the thresholds of significance for construction and operational emissions of criteria pollutants.

Table 3.3-2. BAAQMD CEQA Thresholds of Significance for Criteria Air Pollutants

Pollutant	Construction-Related	Operational-Related	
	Average Daily Emissions (lb/day)	Average Daily Emissions (lb/day)	Maximum Annual Emissions (tpy)
Reactive Organic Gases (ROG)	54	54	10
Nitrogen oxides (NOx)	54	54	10
Particulate Matter (PM_{10})	82	82	15
Particulate Matter ($PM_{2.5}$)	54	54	10
PM_{10}/$PM_{2.5}$ (fugitive dust)	Best Management Practices	None	
Local Carbon Monoxide (CO)	None	9.0 ppm (8-hour average), 20.0 ppm (1-hour average)	
Risk and Hazards for new sources and receptors (Individual Project)	Same as Operational Thresholds	Compliance with Qualified Community Risk Reduction Plan OR ▪ Increased cancer risk of >10.0 in a million ▪ Increased non-cancer risk of > 1.0 Hazard Index (Chronic or Acute) ▪ Ambient $PM_{2.5}$ increase: > 0.3 µg/m^3 annual average Zone of Influence: 1,000-foot radius from property line of source or receptor	
Risk and Hazards for new sources and receptors (Cumulative Threshold).	Same as Operational Thresholds	Compliance with Qualified Community Risk Reduction Plan OR ▪ Cancer risk: >100 million (from all local sources) ▪ Non-cancer risk: > 10.0 Hazard Index (from all local sources, Chronic) ▪ Ambient $PM_{2.5}$: > 0.8 µg/m^3 annual average (from all local sources) Zone of Influence: 1,000-foot radius from property line of source or receptor	

Pollutant	Construction-Related	Operational-Related	
	Average Daily Emissions (lb/day)	Average Daily Emissions (lb/day)	Maximum Annual Emissions (tpy)
Accidental Release of Acutely Hazardous Air Pollutants	None	Storage or use of acutely hazardous materials located near receptors or new receptors located near stored or used acutely hazardous materials considered significant	
Odors	None	Screening level distances and complaint history	

tpy – tons per year; lb/day – pounds per day; ppm – parts per million
Source: BAAQMD 2010a

Environmental Setting

Napa Valley is situated between the Mayacamas Mountains to the west and the Vaca Mountains to the east. Napa Valley is widest at its southern end and narrows to the north, and the mountains surrounding the valley serve as effective barriers to the prevailing northwesterly winds, so pollutants entering the valley can become trapped without pathways to disperse. During the summer and fall, prevailing winds can transport non-local air pollution from the San Pablo Bay and locally generated ozone precursors northward where the valley narrows, effectively trapping and concentrating the pollutants under stable conditions. The local upslope and downslope flows set up by the surrounding mountains may also recirculate pollutants, adding to the total burden. The high frequency of light winds and associated stable conditions during the fall and winter contributes to the buildup of particulates and CO from automobiles, agricultural burning and fireplace burning.

The BAAQMD generally defines a *sensitive receptor* as a facility or land use that houses or attracts members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of sensitive receptors include schools, hospitals, convalescent facilities, and residential areas.

Napa County defines sensitive receptors/land uses as locations where people reside or where members of the population are located who are particularly sensitive to the effects of air pollutants (e.g., children, the elderly and people with illnesses). Specific areas considered as sensitive receptors include residences, hospitals or healthcare facilities, parks and wildlife areas, and schools.

The closest school is Yountville Elementary, located over a mile from the closest Project construction site. All other schools in the vicinity are located in the City of Napa, over 2 miles south of the closest Project restoration site. A day care facility, Wine Country Day Preschool, is located near Yountville Elementary over a mile from the closest Project restoration site. There are no parks, hospitals, healthcare facilities, elder care homes, or wildlife areas within 2 miles of the Proposed Project (Google Earth 2013).

The remaining sensitive receptors in the project vicinity are limited to single-family residences located at various distances away along the Napa River between Oakville Cross Road and Oak Knoll Avenue.

Methodology for Estimating Emissions

Construction-related emissions were estimated using the Road Construction Emissions Model (Model) (Version 7.1.4, developed by Sacramento Metropolitan Air Quality Management District). The Model estimates emissions from Project construction activities, including: soil hauling, on-road worker commute vehicle trips, water truck use, grubbing and vegetation removal, grading and excavation, and use of various types of off-road construction equipment.

The Model utilizes CARB's EMFAC2011, CARB's official model for estimating emissions from on-road cars and trucks, and the OFFROAD2007 and OFFROAD2011 models, which calculate emissions from off-road construction equipment. The Model estimates the average daily emissions of ROG, CO, NOx, particulate matter less than 10 microns in diameter (PM_{10}), and $PM_{2.5}$ throughout construction. Construction would occur over a total duration of 5 years, and as many as 2 restoration sites would be constructed at a time.

Model inputs include construction equipment use, haul distance, and commuter distance values as described in general in the Project Description, and shown in detail in Appendix C (Air Quality and GHG Emissions Model Results). Complete model inputs and results are shown in Appendix C. The criteria pollutant emissions model results for the construction period are shown in **Table 3.3-3**. Because project maintenance activities would be very minor in comparison to construction activities, emissions from maintenance activities were not specifically calculated. Maintenance emissions are discussed qualitatively below.

Table 3.3-3. Criteria Pollutant Emissions Model Results

Emissions Category	Unmitigated Emissions						
	ROG	CO	NOx	Exhaust		Fugitive Dust	
				PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Total Project Emissions (tons)	1.2	6.7	18.2	0.7	0.6	0.2	0.0
Annual Project Emissions (tons/year)	0.2	1.3	3.6	0.1	0.1	0.0	0.0
Average Daily Project Emissions (pounds/day)	0.4	2.4	6.4	0.2	0.2	0.1	0.0
Threshold of Significance average daily emissions (pounds/day)	**54**	**None**	**54**	**82**	**54**	**ECs**	**ECs**

A health risk assessment (HRA) was performed to quantify potential impacts to sensitive receptors from toxic air contaminants (TAC). The HRA was conducted consistent with OEHHA (OEHHA 2012, 2003) and BAAQMD guidelines (BAAQMD 2010a) for determining local community risks and hazards. The HRA is a process followed to evaluate the health risks associated with the Proposed Project. The HRA evaluated project emissions associated with construction equipment. Detailed information on the methodology and data used to conduct the HRA and air dispersion modeling is presented in Appendix C. Results of the HRA analysis are presented in **Table 3.3-4**.

Table 3.3-4. Health Risk Assessment Results

Population	Unmitigated		
	Cancer Risk (in a million)	Chronic HI	PM2.5 (ug/m3)
Resident	3.3	0.0018	0.009
Significance Thresholds	10	1	0.3

Source: see Appendix C

Discussion of Checklist Responses

a. Conflicts with or Obstructs Implementation of the Applicable Air Quality Plan — *No Impact*

A project is deemed inconsistent with air quality plans if it would result in population and/or employment growth that exceeds growth estimates included in the applicable air quality plan, which, in turn, would generate emissions not accounted for in the applicable air quality plan emissions budget. Therefore, projects need to be evaluated to determine whether they would generate population and employment growth and, if so, whether that growth would exceed the growth rates included in the relevant air plans.

The Proposed Project focuses entirely on river restoration, and would not involve the construction of any residential, commercial, or industrial structures or infrastructure that would generate population and/or employment growth (see related discussion in the *Population and Housing* section of this checklist). Because the project would not generate growth, there would be no impact related to inconsistency with air quality planning. No mitigation is required.

b. Violates any Air Quality Standard or Contributes Substantially to an Existing or Projected Air Quality Violation — *Less than Significant*

The SFBAAB is a state and federal non-attainment area for ozone, and a state non-attainment area for PM_{10} and $PM_{2.5}$. A project would have a significant impact if it would contribute substantially to these air quality violations. A substantial contribution is defined as a contribution above the BAAQMD CEQA threshold of significance for construction-related emissions for ozone precursors, PM_{10}, or $PM_{2.5}$. Both NOx and ROG are ozone precursors. As shown in Table 3.3-3, project construction would result in criteria pollutant emissions well below the BAAQMD thresholds.

The project would therefore not contribute substantially to a violation of state and federal air quality standards for ozone or particulate matter, resulting in a less-than-significant impact.

Operational emissions would occur for project maintenance, and similar off-road and power tool equipment would be used for operational activities. However, the level of operational activities would be substantially lower than construction activities. In addition, very little excavation and hauling of soil is anticipated for project operations. Therefore, operational

emissions would be substantially lower than construction emissions, would be substantially below the BAAQMD thresholds, and would therefore be less than significant.

c. Cumulatively Considerable Net Increase of Any Criteria Pollutant for Which the Project Region is a Nonattainment Area — *Less than Significant*

As defined in BAAQMD's CEQA Guidelines, project-level emissions that are below the mass emissions thresholds are considered to be less than cumulatively considerable. As described in item b above, emissions of all criteria pollutants would be less than significant, rendering the Project's contribution to cumulatively significant impacts less than considerable.

d. Expose Sensitive Receptors to Substantial Pollutant Concentrations — *Less than Significant with Mitigation*

Construction-related activities could result in the generation of toxic air contaminants (TACs), specifically diesel particulate matter (PM), from off-road equipment exhaust emissions. Due to the variable nature of construction activity, the generation of TAC emissions in most cases would be temporary, especially considering the short amount of time such equipment is typically operated within an influential distance of sensitive receptors. The assessment of cancer risk and chronic non-cancer health impacts is typically based on a 70-year exposure period, and there is considerable uncertainty in trying to evaluate the cancer risk from projects that will only last a small fraction of a lifetime (OEHHA 2012).

Furthermore, construction impacts are most significant adjacent to the construction area, and the impacts decrease rapidly with distance. Concentrations of mobile-source diesel PM emissions are typically reduced by 70 percent at a distance of approximately 500 feet (CARB 2005). Because there are a few residential receptors that potentially could be impacted by TACs associated with construction of the project, a quantitative health risk assessment was conducted to evaluate the potential health impacts (Appendix C). The health impacts to the highest identified residential receptor is shown in Table 3.3-4 and indicates that emissions would result in health impacts less than the significance threshold of 10 in a million excess cancer risks, and below the (unitless) chronic hazard index threshold of 1. BAAQMD also has a threshold for $PM_{2.5}$ concentration associated with the project. $PM_{2.5}$ emissions were also analyzed for the construction equipment and determined to be less than the significance threshold of 0.3 micrograms per cubic meter. Thus, the impacts would be less than significant.

Project construction and operational activities would also result in local emissions of fugitive dust. BAAQMD's CEQA guidelines recommend adoption of basic best management practices to mitigated fugitive dust emissions. These best management practices are incorporated as Mitigation Measure AQ-1.

Mitigation Measure AQ-1: Reduce Fugitive Dust Emissions during Construction and Maintenance

The County shall ensure that all construction contracts reflect the following requirements:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
4. All vehicle speeds on unpaved roads shall be limited to 15 mph.
5. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
6. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.
7. Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

e. Create Objectionable Odors — *Less than Significant*

Diesel exhaust from construction activities may generate temporary odors while construction of the Proposed Project is underway. Once construction activities have been completed, these odors would cease. Maintenance activities would also generate temporary odors, but the odors would be short-lived and would occur intermittently throughout the project reach. Impacts related to potential generation of objectionable odors are thus expected to be less than significant. No mitigation is required.

3.4 BIOLOGICAL RESOURCES

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the Project:					
a.	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the DFW or USFWS?	☐	☒	☐	☐
b.	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the DFW or USFWS?	☐	☒	☐	☐
c.	Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐
d.	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e.	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f.	Conflict with the provisions of an adopted Habitat Conservation Plan (HCP); Natural Community Conservation Plan; or other approved local, regional, or state HCP?	☐	☐	☐	☒

Environmental Setting

The Project Area supports a range of aquatic and terrestrial habitats that are potentially affected by restoration activities. General descriptions of these habitat types, and the species that commonly utilize them, are provided in this section.

Aquatic Habitats

Aquatic habitats in the Project Area include riverine habitat associated with the Napa River and Conn Creek, as well as some off-channel emergent wetlands. The riverine habitat associated with the Napa River is the primary aquatic habitat relevant to Project activities. To a lesser extent, riverine habitat associated with the Conn Creek and off-channel freshwater wetlands may be affected by Project activities.

Riverine

The Napa River in the Project Area is predominantly an alluvial bed channel. Exposures of erosion resistant clay and bedrock occur in portions of the Project reach. The drainage area at the Oakville Cross Road is ~99 mi^2 and ~219 mi^2 at Oak Knoll Avenue. Streamflow is perennial in the majority of the Project Area. In the Project Area, the river is deeply incised within the valley floor with tall, steep banks. The primary aquatic habitat types in the Project Area are glides and shallow pools. Deeper pools occur in proximity to bed and bank materials that are resistant to scour. Riffles tend to form in portions of the channel that are less entrenched or have a well-developed inset floodplain.

Only a few species of vascular plants typically grow within the riverine habitat. Species that may be found in the stream or below ordinary high water include torrent sedge (*Carex nudata*), giant chain fern (*Woodwardia fimbriata*), and small-fruited bulrush (*Scirpus microcarpus*). Certain non-vascular plants, such as aquatic mosses and filamentous algae that are tightly attached to rocks by strong holdfasts can survive the fast current. Slow flowing or backwater sections of the river support aquatic vegetation such as cattail (*Typha* spp.), nutsedge (*Cyperus* spp.), *Ludwigia*, water plantain (*Alisma plantago-aquatica*), and smartweeds (*Polygonum* spp.).

Common, widespread bird species that use instream habitats in the Project Area include herons, egrets, and waterfowl. Some species of amphibians use stream habitats for breeding, particularly bullfrogs (*Lithobates catesbeianus),* which are not native to California. Native amphibians that may be present in and around aquatic habitats in the Project Area include Coast Range newt (*Taricha torosa torosa*), and Pacific chorus frog (*Pseudacris regilla*). Western pond turtles (*Actinemys marmorata*) also use these habitats, often concentrated in areas of optimal habitat such as side channel and backwater areas. California freshwater shrimp (*Syncaris pacifica*) may also occur in select habitats within the river (See Appendix D).

The Project reach provides habitat for a wide variety of freshwater and anadromous fish species. The fish assemblage in the Project reach is dominated by native species. Native fish species likely to use the Project reach include Pacific Lamprey (*Entosphenus tridentatus*), River Lamprey (*Lampetra ayresi*), Western Brook Lamprey (*L. richardsoni*), Sacramento Pikeminnow (*Ptychocheilus grandis),* California Roach (*Hesperoleucus symmetricus*), Sacramento Sucker *(Catostomus occidentalis)*, Steelhead (*Oncorhynchus*

mykiss), Chinook Salmon (*O. tshawytscha*), Threespine Stickleback (*Gasterosteus aculeatus*), Riffle Sculpin (*Cottus gullosus*), Prickly Sculpin *(Cottus asper*), and Tule Perch *(Hysterocarpus traski*). Non-native species likely to be present in this reach of the Napa River include Fathead Minnow (*Pimephales promelas*), Golden Shiner (*Notemigonus crysoleucas*), Largemouth Bass (*Micropterus salmoides*), and Bluegill (*Lepomis macrochirus*) (Koehler and Blank 2012).

Steelhead are relatively widespread in Napa Valley streams (Ecotrust and Friends of Napa River 2001 and 2002, Stillwater Sciences and Dietrich 2002, Leidy et al. 2005, Koehler and Blank 2010), but current abundance is thought to be only a small fraction of historical levels. Fall-/Late Fall-run Chinook Salmon also spawn and rear in the Napa River (Koehler and Edwards 2008, Koehler and Blank 2010). Annual observations in the Napa River of spawning adults and juvenile Chinook Salmon by the Napa County Resource Conservation District from 2004–2012 indicate that successful spawning occurs in most years (Koehler and Blank 2012).

Despite considerable habitat degradation and loss of anadromous fish habitat relative to historical conditions, the Napa River watershed still contains extensive areas of relatively high-quality spawning and rearing habitat for steelhead and salmon (Koehler and Blank 2010). The Napa River watershed is considered one of the most important watersheds in the San Francisco Bay Area for conservation and restoration of the Central California Coast Distinct Population Segment (DPS) of Steelhead (Becker et al. 2007).

Freshwater Wetlands

Freshwater wetlands occur in overflow channels, off-channel depressions, and irrigation ponds. The spatial extent of this habitat type is limited because of the incised nature of the channel within the Project Area. Perennial wetlands that hold water for most or all of the year are characterized by dense stands of cattail and bulrush (*Schoenoplectus [=Scirpus]* spp). Ponds and other open water areas may support plants with floating leaves, such as pondweeds (*Potamogeton* spp.), mosquito fern (*Azolla* spp.), and duckweed (*Lemna* spp. and *Wolfia* spp.), or submerged plants, such as Canadian pondweed (*Elodea canadensis*) and *Najas* spp.

Freshwater wetlands, particularly those with native vegetation and high structural complexity, provide high-quality wildlife habitat that offers nesting, foraging, roosting, and cover for a variety of species. The high plant productivity typical of freshwater wetlands offers abundant food sources and cover for wildlife. The wildlife community that receives the most evident benefit from freshwater wetlands is birds. Common and uncommon bird species typically associated with emergent freshwater wetlands that may be found in Napa County include grebes, rails (e.g., Virginia Rail [*Rallus limicola*], American Coot [*Fulica americana*]), herons, egrets, ducks (e.g., Wood Duck [*Aix sponsa*], Cinnamon Teal [*Anas cyanoptera*]), shorebirds, Marsh Wren (*Cistothorus palustris*), and Common Yellowthroat (*Geothlypis trichas*). Amphibians and reptiles that use freshwater wetlands include Pacific chorus frogs, western toads (*Bufo boreas*), and garter snakes (*Thamnophis* spp.), which in turn provide food for animals including birds and mammals. Mammal visitors to freshwater wetlands include deer mouse (*Peromyscus* spp.), California meadow vole (*Microtus californicus*), river otter (*Lutra canadensis*), and black-tailed "Mule" deer (*Odocoileus hemionus californicus*). Muskrats (*Ondatra zibethicus*) and beaver (*Castor canadensis*) may use freshwater wetlands for cover, food, and/or hut construction. Many bat species forage

for insect prey over wetlands. Freshwater wetlands typically contain many invertebrates—such as dragonflies, craneflies, and snails—that provide an important food source for other species.

Terrestrial Habitats

Riparian

Riparian habitats in the Project reach include valley oak riparian forest, mixed willow riparian forest, and riparian scrub. Valley oak riparian forest is the most abundant vegetation community along the river. This vegetation community is characteristic of the *Great Valley Oak Riparian Forest* habitat described by Holland (1986) and the *Valley Oak–(California Bay–Coast Live Oak–Walnut–Ash) Riparian Forest NFD*[1] *Association* mapped by Thorne et al. (2004). Valley oak (*Quercus lobata*) is dominant and one of two suites of tree species is sub-dominant; either California bay (*Umbellularia californica*), coast live oak (*Q. agrifolia*), walnut (*Juglans californica* var *hindsii*) and Oregon ash (*Fraxinus latifolia*), or Fremont cottonwood (*Populus fremontii*) and coast live oak (Napa County 2005). The understory community in the valley oak riparian forest typically includes species such as bracken fern (*Pteridium aquilinum*), Santa Barbara sedge (*Carex barbarae*), arroyo willow (*Salix lasiolepis*), California rose (*Rosa californica*), common snowberry (*Symphoricarpus albus*), California blackberry (*Rubus ursinus*), and wild grape (*Vitus californica*) (Napa County 2005).

Mixed willow riparian forest and riparian scrub habitats include Pacific willow (*Salix lucida ssp. lasiandra*), red willow (*S. laevigata*), black willow (*S. gooddingii*), narrowleaf or sandbar willow (*S. exigua*), and arroyo willow (Napa County 2005). These species may be found in pure or mixed stands. Other species commonly found in these habitats include Fremont cottonwood, valley oak, coast live oak, California rose, California blackberry, common snowberry, white alder (*Alnus rhombifolia*), and big-leaf maple (*Acer macrophyllum*).

Riparian habitats are valuable for wildlife since they provide shade, water, favorable microclimates, and important movement corridors. In-stream woody debris from riparian trees and shrubs also provides important habitat elements, forming scour pools and logjams used by insects, amphibians, and fish (Riparian Habitat Joint Venture 2004). Riparian forests are particularly important for California landbird species, providing breeding habitat, over-wintering grounds, migration stopover areas (Riparian Habitat Joint Venture 2004), and movement corridors for bird species with somewhat limited mobility such as California Quail (*Callipepla californica*). Multilayered, structurally complex vegetation enhances quality of riparian habitat.

Wildlife associated with riparian habitats include amphibians such as Pacific chorus frog; reptiles such as ring-necked snake (*Diadophis punctatus*) and sharp-tailed snake (*Contia tenuis*); birds such Black Phoebe (*Sayornis nigricans*), Yellow-breasted Chat (*Icteria virens*), Bushtit (*Psaltriparus minimus*), Pacific-slope Flycatcher (*Empidonax difficilis*), Orange-crowned Warbler (*Vermivora celata*), and Great-horned Owl (*Bubo virginianus*); and mammals such as black-tailed deer, raccoon (*Procyon lotor*), bobcat (*Lynx rufus*), dusky-footed woodrat (*Neotoma fuscipes fuscipes*), beaver (*Castor Canadensis*) and shrews (*Sorex*

[1] "NFD" indicates that the community was "not formally defined" in *A Manual of California Vegetation* (Sawyer and Keeler-Wolf, 1995).

spp.). A variety of bat species may roost in riparian trees including the western red bat (*Lasiurus blossevillii*), a state species of special concern. Riparian habitat also contributes essential functions to aquatic habitats that support steelhead, Chinook Salmon, and other fish species.

Grasslands and Meadows

Non-native, annual grasslands and sedge meadows occur in undeveloped areas adjacent to riparian habitats. These habitats occur in between the riparian corridor and vineyards. These habitats areas are not commonly flooded by flows from the Napa River. Vegetation species composition in the grasslands varies throughout the Project reach, with some sites being more diverse than others; all sites are dominated by non-native annual grasses.

Sedge meadow habitat occupies shallow swales and topographic depressions within grasslands and openings in riparian forests. Historically, when the main channels were less entrenched, these low lying areas and swales where inundated on a more frequent basis. Under current hydrologic conditions, they are only flooded during infrequent high flow events and/or wet years with above average precipitation. Sedge meadows in open areas are generally dominated by Santa Barbara sedge. Swales in forested areas have a more diverse species assemblage including various sedges and forbs.

Grassland and meadow habitats provide important wildlife habitat and are generally underrepresented in Project Area. These habitats provide valuable foraging areas for several bird species. Small, burrowing mammals are abundant in these habitats, and larger mammals such as black-tailed deer often use these habitats for foraging and cover.

Discussion of Checklist Responses

a. Substantial Adverse Effect, Either Directly or Through Habitat Modifications, on Any Species Identified As A Candidate, Sensitive, or Special-Status Species — *Less Than Significant with Mitigation*

For the purposes of this assessment, special-status species are those that are listed as rare, species of concern, candidate, threatened or endangered by the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), California Department of Fish and Wildlife (CDFW)[2], and local experts as documented in the Napa County BDR (Napa County 2005). Special-status plant and animal species with the potential to occur in the Project Area were identified through a review of the following resources:

- U.S. Fish and Wildlife Service (USFWS) List of Federal Endangered and Threatened Species that Occur in or May Be Affected by Projects in Napa County (USFWS 2013, Appendix D).
- California Natural Diversity Database (CNDDB) Database Query within a 5-mile radius (Figures D-1 and D-1, Appendix D)

[2] Includes California Rare Plant Rank (CRPR) listed species.

- California Native Plant Society (CNPS) Rare Plant Inventory Database Query within a 9-quadrangle area for the Rutherford, Yountville and Napa USGS quadrangles (Appendix D)
- Napa County BDR (Napa County 2005)

Tables D-1 and D-2 of Appendix D list the species known to occur within the vicinity of the Project Area. The potential for special-status species to occur in areas affected by Project activities was evaluated according to the following criteria:

- **No Potential:** Project activities would not occur in habitat that supports the species. Species considered to have no potential to be affected by Project activities include those associated with: salt and brackish marsh, salt ponds, vernal pools, serpentine substrate, broadleafed upland forest, chaparral, coniferous forest, and cismontane woodland.
- **Low:** Few of the habitat components meeting the species requirements are present in areas that may be impacted by Project activities. In these instances, the species is not likely to be impacted.
- **Moderate:** Some of the habitat components meeting the species requirements are present in areas that may be impacted by Project activities.
- **High:** All of the habitat components meeting the species requirements are present in areas that may be impacted by Project activities.

A discussion of the Project's potential effects on special-status species and the resultant level of impacts are provided below.

Plants

Special-status plant species known to occur in the vicinity of the Project Area are listed in Table D-1 of Appendix D. Sixty of the 66 plant species listed in Table D-2 are considered to have no potential to occur in the Project Area. These species are either associated with habitats that do not occur in the Project Area (e.g., chaparral, serpentine, vernal pools) or the Project Area is outside the species' document range.

Six plant species are considered to have low or moderate potential to occur in the Project Area. These species are generally associated with grasslands, meadows, vernal swales, or freshwater wetlands. None of these species are associated with riverine habitat, riparian forest, or disturbed/agricultural lands, which are the primary habitat types that would be impacted by Project activities.

Construction activities that involve disturbance of grasslands, meadows, vernal swales, or freshwater wetlands could result in permanent impacts to special-status plants with the potential to occur in the Project Area. In accordance with EC-21BIO, any construction activity in areas with the potential to support special-status plants would require pre-construction surveys conducted by a qualified botanist during the appropriate blooming time (Table 2-11). If special-status plants are observed, measures discussed in EC-21BIO would be implemented. These measures would reduce construction-related impacts to special-status plants to a level that would be less than significant. Management and

maintenance of restoration sites is not expected to impact special-status plant species. Therefore, no mitigation is required.

In the long-term, the Proposed Project is not expected to have substantial negative or beneficial effects to special-status plants because few special-status plant species occur in the habitats that are the focus of the Project activities.

Invertebrates

Special-status invertebrates known to occur in the vicinity of the Project Area are listed in Table D-2 of Appendix D. Most of the special-status invertebrates listed in Appendix D, Table D-2 are considered to have no potential to occur in the Project Area because suitable habitat is not present or the Project Area is not within the species' documented range. Vernal pool fairy shrimp (*Branchinecta lynchi*) are considered to have a low potential for occurring in the Project Area. This species is commonly associated with vernal pool habitat, but may also be found in other seasonally ponded depressions. Project activities are not expected to impact this habitat type. Furthermore, EC-19BIO would require a qualified biologist to conduct a habitat assessment prior to initiating construction. Any habitat with the potential to support vernal pool fairy shrimp would be avoided, and not directly or indirectly impacted by the Project.

California freshwater shrimp (CFS) are found in low elevation, low gradient, freshwater, perennial streams in Marin, Napa, and Sonoma counties. Winter habitat includes shallow margins of stream pools containing undercut banks and exposed living fine-root material that provide shelter and refuge from high water velocities associated with storm events. Summer habitat includes submerged leafy branches. It is believed both winter and summer habitat components need to be found in close proximity in order for this species to persist for prolonged periods (USFWS 2011).

In support of this environmental review, a CFS habitat assessment was conducted for the Proposed Project (Stillwater Sciences 2013). The results of the assessment are provided in Appendix E. The Project reach generally contains very little suitable winter habitat for CFS because the narrow and entrenched condition of the channel typically lacks deep undercut banks with complex root structures that CFS require to survive the winter high-flow period. Isolated pockets of moderate to good quality winter habitat do exist, but are generally few and far between. The relative lack of suitable winter habitat could be considered a limiting factor for CFS production within the Project reach. There is considerably more moderate to good quality summer habitat than winter habitat. In general, submerged terrestrial vegetation (willows and berry vines) was present within much of the assessment area, but most of it was either not very complex and/or did not extend very far below the water surface, which reduced or eliminated it as potential habitat. It is also worth noting that the Project Area contains a number of native and non-native fish species that prey upon CFS. These include the native Sacramento Pikeminnow as well as non-native bluegill and largemouth bass. The presence of these species imposes heavy predation pressure on CFS and may represent a limiting factor to their abundance in the Project Area. For these reasons, CFS are considered to have a moderate potential to occur in the Project Area.

Table 3.4-1 summarizes of presence and quality of winter and summer CFS habitat conditions at each of the proposed restoration sites, and provides a preliminary impact assessment.

Table 3.4-1. California Freshwater Shrimp Habitat Ratings and Impact Assessment

Restoration Site	Treatment	Habitat Rating		Impact Assessment
		Winter	Summer	
23	Floodplain bench, alcove, biotech stabilization, LWD	None	Marginal	Impacts to summer habitat will be avoided. Summer habitat quantity and quality will be increased in the long-term.
22	Berm removal, floodplain bench, biotech stabilization, high flow channel, willow baffles	Good	Good	Impacts on winter and summer habitat will be avoided by locating in-stream structures away from CFS habitat.
21	Bank grading, biotech stabilization, LWD, willow baffles	Good	Marginal	Impacts on winter and summer habitat will be avoided by locating in-stream structures away from CFS habitat. Vegetated soil lifts may increase winter and summer habitat in the long-term.
20	Managed retreat, selective grading, tree preservation, high flow channel, biotechnical stabilization, RSP removal, revegetation	None	Moderate	Impacts to summer habitat will be avoided. Summer habitat quantity and quality will be increased in the long-term.
19	Vineyard road realignment, managed retreat, secondary channel grading, boulder clusters	None	None	No impacts on winter or summer habitat.
18	Vineyard road realignment, managed retreat, RSP removal, biotechnical stabilization	None	None	No impacts on winter or summer habitat.
17	Selective grading, biotechnical stabilization, vegetated soil lifts, tree protection	None	None	No impacts on winter and summer habitat. Vegetated soil lifts may result in long-term increase in quantity and quality of summer habitat.
16	Invasive plant removal, revegetation, vineyard road realignment, biotechnical stabilization	None	None	No impacts on winter and summer habitat.
15	Managed retreat	Unknown	Unknown	No active restoration is proposed for this site. No impacts on winter or summer habitat.
14	Setback berm, grade bank, biotechnical stabilization, LWD, boulder clusters, gravel augmentation	Good	Moderate	Temporary and permanent impacts to winter and summer habitat would occur. Long-term improvement in quantity and quality of summer habitat.
13	Widen low flow channel, floodplain and wetland development, biotech stabilization, LWD, boulder clusters, and grade a high flow swale.	Good	Moderate	Temporary impacts to winter habitat and permanent impacts to summer habitat would occur. Long-term improvement in quantity and quality of summer habitat.

Restoration Site	Treatment	Habitat Rating		Impact Assessment
		Winter	Summer	
12	Floodplain bench, biotech stabilization, LWD, boulder clusters	None	Good	Impacts to summer habitat will be avoided by locating in-stream structures away from CFS habitat. Long-term improvement in quantity and quality of summer habitat.
11	Floodplain grading, reconnect vineyard pond	None	None	No impacts on winter or summer habitat.
10	Floodplain grading, biotech stabilization, bank setback, expanded high flow channel, tree islands	None	Poor	Impacts to summer habitat will be avoided.
9	Channel widening, floodplain restoration biotech stabilization, LWD, willow baffles	None	Poor	Impacts to summer habitat will be avoided by locating in-stream structures away from CFS habitat. Long-term improvement in quantity and quality of summer habitat.
8	Floodplain benches, secondary channel, biotech stabilization, LWD, willow baffles, boulder clusters	None	None	No impact on winter or summer habitat.
7	Realign vineyard road, vegetated drainage swale, wetland, biotech stabilization	Poor	Moderate	Impacts to winter and summer habitat will be avoided.
6	Breach berm, secondary channel grading, floodplain benches, willow baffles	None	None	No impact on winter or summer habitat.
5	Breach berm, secondary channel grading, floodplain benches, willow baffles	Moderate	Moderate	Impacts to winter and summer habitat will be avoided. Winter habitat in upstream 150 ft may be improved by Project.
4	Wetland improvement, revegetation, channel alignment	Unknown	Good	Impacts to winter and summer habitat will be avoided.
3	High flow alcove, biotech stabilization, revegetation, LWD structures	Unknown	Good	Impacts to winter and summer habitat will be avoided by locating in-stream structures away from CFS habitat.
2	Bank grading, biotech stabilization, LWD, willow baffles, revegetation	None	Marginal	Impacts to summer habitat will be avoided by locating in-stream structures away from CFS habitat. Long-term improvement in quantity and quality of summer habitat.
1	Bank grading, biotech stabilization, LWD, willow baffles, revegetation	Moderate	Moderate	Impacts to winter and summer habitat will be avoided by locating in-stream structures away from CFS habitat. Long-term improvement in quantity and quality of summer habitat.

In general, the Project has been designed to avoid disturbance to CFS winter and summer habitat. However, complete avoidance at all Restoration Sites is not feasible. Dewatering and channel construction activities may result in temporary and permanent impacts to CFS and their habitat. Specifically, impacts would occur in Restoration Sites 13 and 14, as summarized in **Table 3.4-2**.

Table 3.4-2: Potential Impacts on California Freshwater Shrimp Habitat

Restoration Site	Temporary Summer Habitat Impact	Permanent Summer Habitat Impact	Temporary Winter Habitat Impact	Permanent Winter Habitat Impact
	(ft^2)			
13	76	133	74	43
14	0	36	102	0
Total	**76**	**169**	**176**	**43**

Dewatering at Sites 13 and 14 would result in a temporal impact on summer habitat and any CFS that may be present. Temporary loss of 76 ft^2 of summer habitat would have a less than significant impact to CFS because this habitat is abundant in the Project Area (Stillwater Sciences 2013). However, direct impacts to CFS would be considered potentially significant. Mitigation measures BIO-1a would reduce direct impacts to CFS to a level that is less than significant by relocating CFS outside of dewatering areas and excluding them from instream work areas.

> **Mitigation Measure BIO-1a: Minimize Impacts to California Freshwater Shrimp during Channel Dewatering**
> Prior to channel dewatering or otherwise disturbing any CFS habitat, a qualified biologist with a current ESA section 10(a)(1)(A) permit for CFS shall conduct a rescue and relocation operation. Before removal and relocation begins, the biologist shall identify the most appropriate release location(s). Release locations should offer ample habitat for CFS and shall be selected to minimize the likelihood of reentering the work area. To prevent CFS from reentering the work area, the channel will be blocked by placing fine-meshed nets or screens above and below the work area. To minimize entanglement, mesh diameter will not exceed 1/8 inch. The bottom edge of the net or screen will be secured to the channel bed. Exclusion screening will be placed in low velocity areas to minimize impingement. Screens shall be checked periodically and cleaned of debris to permit free flow of water. Handling of CFS shall be minimized, as feasible. CFS will be held temporarily in cool, shaded water in a container with a lid. Aeration will be provided with a battery-powered external bubbler. A thermometer will be placed in each holding container and partial water changes will be conducted as necessary to maintain a stable water temperature. CFS shall not be held more than 30 minutes. Any CFS rescued or relocated shall be reported to the USFWS and CDFW.

Permanent impacts to CFS summer and winter habitat would be offset by restoration activities. As described in the Project Description, the Proposed Project would include creation of CFS winter and summer habitat features at various locations. Winter habitat features would re-establish undercut banks that provide the substrate (i.e., exposed roots) and low-velocity refugia required by CFS. Potential summer habitat features would involve creating areas with submerged vegetation along channel margins and in low velocity

regions to provide suitable conditions for CFS foraging habitat. CFS habitat features would be constructed out of a combination of biotechnical elements and large wood, and designed with input from federal and state agencies.

An example winter habitat feature may include vegetated soil wraps that are cantilevered over relatively mobile substrates on outside meander bends where flow can scour beneath the supporting logs. The soil wraps would be staked with pole cuttings. Over time, the substrate beneath the vegetated soil wraps would be scoured away and the developed undercut would expose complex root matrices and interstitial habitat, which would be available for winter use by CFS. The estimated areas of summer and winter CFS habitat included in the Proposed Project in Sites 13 and 14 are shown in **Table 3.4-3**.

Table 3.4-3: Proposed California Freshwater Shrimp Habitat Restoration

Proposed CFS Habitat Restoration	Length (linear feet)	Area (ft^2)
Total Summer Habitat to be Constructed	327	980
Total Winter Habitat to be Constructed	438	876

Upon consideration of Tables 3.4-2 and 3.4-3, the Proposed Project would result in creation of far more CFS habitat than would be impacted by Project construction, with over a 4:1 ratio of habitat creation to impact. Implementation of Mitigation Measure BIO-1b would ensure the establishment of CFS habitat at the proposed ratio and therefore reduce impacts to CFS to a level that is less than significant.

Mitigation Measure BIO-1b: Create CFS habitat and Monitor Performance
The County shall construct CFS winter and summer habitat mitigation features at a 4:1 ratio of creation to impact. Winter and summer CFS habitat mitigation features will be monitored for a period of 5 years to assess the mitigation's effectiveness. The performance criteria for CFS habitat shall be as follows:

- at least 75% of the winter habitat mitigation area shall yield undercut banks/scour pockets (defined as areas where eddy formation has created topographic variability of 1.0 foot or more in the elevation of the toe of the bank).
- at least 75% of the summer habitat mitigation area shall have overhanging vegetation (willows, sedge, herbs, vines, etc.) in contact with or extending below the water surface during mean summer baseflow conditions.

The County shall submit annual monitoring reports to USFWS and CDFW documenting the progress toward meeting the mitigation success criteria. This report shall detail (1) the area of CFS habitat impacted during each construction phase; (2) the amount of habitat created; (3) comparison to performance criteria and an explanation of failure to meet such criteria, if any; (4) presence of CFS, if any; (5) occurrences of incidental take, if any; and (6) other pertinent information. If criteria are not met within 5 years after construction of the enhancement features, USFWS and CDFW will be contacted to discuss if monitoring should continue. If USFWS/CDFW conclude that the mitigation is a failure, then USFWS/CDFW may require the County to make modifications to the features or to develop and implement an alternative mitigation plan. If the criteria are not met within 5 years but it is determined that 5 more years of management and monitoring is warranted,

and the criteria are not met at the end of the 10 year period, the mitigation shall be determined a failure and the County shall implement alternative mitigation.

Long-term effects of the Proposed Project on CFS habitat in the Project Area are anticipated to be beneficial due to the enhanced/restored summer and winter habitat features and reduction of flow velocities during high flow events.

Fish

A primary objective of the Proposed Project is to improve habitat for special-status salmonids including steelhead and Chinook Salmon. However, construction activities such as channel widening, which would also include activities such as the construction of flood benches, alcoves, and bank setbacks, could result in temporary impacts to special-status fish species and their habitat. The Project incorporates several measures to minimize potential short-term adverse impacts on special-status fish species, including avoiding the spawning season for salmonid species and determining the best means to bypass flow through the work area to minimize disturbance to the channel and avoid direct mortality of special-status fish. In accordance with EC-25BIO, a qualified biologist would also be present to ensure that fish and other aquatic vertebrates are not stranded during channel dewatering activities and if necessary, relocate individuals in areas slated for construction (Table 2-11). With these measures in place, impacts to special-status fish species would be reduced to a less than significant level. Therefore, no mitigation is required.

In the long-term, the Proposed Project is expected to have substantial beneficial effects to special-status fish species (particularly salmonids) because the restoration activities would expand and improve the quality of aquatic habitat.

Reptiles and Amphibians

Special-status reptiles and amphibians known to occur in the vicinity of the Project Area are listed in Table D-2 of Appendix D. Species with the potential to occur in the Project Area are discussed below.

Western pond turtle (WPT) is known to occur along the Napa River and has a high potential to occur in the Project Area. Western pond turtles are likely to utilize the aquatic habitats in the Project Area for foraging, basking, and mating. Female WPT tend to seek out open areas with sparse, low vegetation (annual grasses and herbs), low slope angle, and dry hard soil for nest sites (USFS 2009). Restoration sites in the Project Area generally provide only marginal nesting habitat for this species because the streambanks are very steep. Nevertheless, construction activities such as the construction of flood benches, alcoves, berms and bank setbacks could result in adverse impacts to WPT, if present.

The Proposed Project incorporates measures to avoid and minimize impacts to WPT. EC-22BIO includes pre-construction surveys for adult WPT and nests. If WPT nests are found, a 100-ft buffer will be established around the location of the nests until the young have left the nest, as determined by a qualified biologist (Table 2-11, EC-22BIO). While nests are often difficult to find, the surveys would minimize the potential for nest sites to be disturbed. With these measures in place, impacts would be reduced to the extent feasible and are expected to be less than significant. No mitigation is required.

In the long-term, the Proposed Project is expected to have beneficial effects to WPT because the restoration activities would expand and improve the quality of aquatic and upland habitat for WPT.

Foothill yellow-legged frog (FYLF) is one of the few obligate stream breeding ranid frogs in the U.S. The Napa River in the Project Area provides marginally suitable breeding habitat for this species. Limiting factors for FYLF in the Project Area include high flow velocities during the breeding season (typically March through June), high fine sediment loads, and presence of native and non-native predators. FYLF have not been documented on the main stem of the Napa River; foothill tributaries provide moderate to high quality habitat for this species.

Foothill yellow-legged frogs are not likely to occur in the Project Area. However, if this species were to occur, construction activities such as vegetation removal, grading and dewatering could result in adverse impacts to this species. EC-22BIO includes pre-construction surveys for special-status amphibians including FYLF. In the unlikely event FYLF eggs or tadpoles are found, a 100-ft buffer will be established around the location until juveniles disperse from the breeding site, as determined by a qualified biologist (Table 2-11, EC-22BIO). If adults are present in the construction area, work would be stopped until individuals are allowed to disperse on their own volition or the species is relocated by a qualified biologist. With these measures in place, impacts would be reduced be reduced to a less than significant level. No mitigation is required.

In the long-term, the Proposed Project is not expected to have substantial negative or beneficial effects to FYLF because Project activities are not anticipated to substantially improve habitat for this species.

California red-legged frog (CRLF) has not been observed in the Napa Valley within the past 100 years. The most recent known records of CRLF are from the early 20th century. Specimens were collected in 1908 and 1910 from Calistoga and "Suscol" (now part of the eastern edge of the City of Napa) (NMNH 2013). They have also been collected two miles southwest of Napa in 1912 and 14 miles west of Monticello Dam in 1963 (University of California, Museum of Vertebrate Zoology).

Aquatic habitat in the Project Area provides only marginally suitable breeding habitat for CRLF. The Napa River is not likely to support breeding of CRLF because of the flashy hydrology during the breeding season. Off-channel wetlands and vineyard stock ponds are also unlikely to support CRLF breeding because of their isolated position in the landscape (i.e., general lack of suitable dispersal corridors) and the presence of bullfrogs. As a result, they are considered unlikely to be to be present at this time. At best, aquatic and riparian habitat associated with the Napa River would function as dispersal habitat for CRLF in the unlikely event the species is present in the Project Area. However, if this species were to occur, construction activities such as vegetation removal, grading and dewatering could result in adverse impacts to this species. EC-22BIO includes pre-construction surveys for special-status amphibians including CRLF. In the unlikely event CRLF eggs or tadpoles are found, a 100-ft buffer will be established around the location until juveniles disperse from the breeding site, as determined by a qualified biologist (Table 2-11, EC-22BIO). If adults are present in the construction area, work would be stopped until individuals are allowed to disperse on their own volition or the species is relocated by a qualified biologist with

permission to handle CRLF. With these measures in place, impacts would be reduced be reduced to a less than significant level. No mitigation is required.

Birds

Special-status bird species known to occur in the vicinity of the Project Area are listed in Table D-2 of Appendix D. Species with the potential to occur in the Project Area are discussed below.

Swainson's Hawk (SWHA). In 2013, a nesting pair of SWHAs was observed in the Rutherford Reach of the Napa River, immediately upstream of the Project Area. Suitable nesting habitat is present in the Project Area, and this species is considered to have a high potential to occur. The Project Area provides marginal to low quality foraging habitat for SWHA. If present, temporary construction-related activity could generate noise and visual distractions that could disturb SWHA and potentially cause failure of a nest, which would be considered a significant impact. Removal of nest trees outside of the nesting season would also be considered a potentially significant impact because of the species' high fidelity to breeding sites (Woodbridge 1998).

The Proposed Project incorporates measures to avoid and minimize impacts to SWHA. EC-18BIO listed in Table 2-11 includes pre-construction protocol-level surveys for SWHA. In the event that an active nest is found during surveys, a minimum of 0.25-mile no work buffer will be established around the SWHA nest until the young have fledged or the nest becomes inactive. These measures would minimize impacts to SWHA. However, impacts could remain potentially significant if known nest trees are removed. Implementation of Mitigation Measures BIO-2a and BIO-2b would reduce impacts to SWHA to a level that is less than significant by assessing the impacts of nest tree removal and mitigating these impacts accordingly.

Mitigation Measure BIO-2a: Assess Impacts of Removing Special-Status Raptor Nest Trees
If a known nest tree of a special-status raptor (e.g., Swainson's Hawk, White-tailed Kite) is located within a restoration site and is planned for removal, a qualified CDFW-approved biologist will conduct an assessment of the nest tree. The assessment will evaluate the importance of preserving the nest tree by evaluating factors such as nest site success, site fidelity, nest integrity, raptor density/competition, predator pressure, and the tree's structure relative to surrounding habitat. If the biologist determines that removal of the nest tree cannot be sufficiently mitigated, then the County will redesign the Proposed Project to avoid removal of the nest tree. If the biologist determines that mitigation is feasible, the County will implement mitigation measure BIO-2b.

Mitigation Measure BIO-2b: Develop and Implement a Mitigation Plan for Removal of Special-Status Raptor Nest Trees
If removal of a special-status raptor nest tree is proposed, the County will develop a plan to mitigate for the loss of the nest tree. At minimum the mitigation plan will include replanting of species with similar structure to the nest tree at a 5:1 ratio and within 1,000 ft of the nest site. If replacement planting is implemented, monitoring will be conducted annually for 5 years to assess the mitigation's effectiveness. The performance standard for the mitigation will be 65% survival of replacement

plantings. The mitigation plan may also include preservation of other trees with similar structure to the nest tree and in close proximity to the nest site. Prior to removing a nest tree, the mitigation plan shall be submitted to CDFW for approval. CDFW will have authority to reject the mitigation plan and require that the nest tree be preserved if CDFW finds the mitigation to be inadequate. If known nesting trees of special-status raptors are removed it will take place outside of the raptor nesting season.

In the long-term, the Proposed Project is expected to have beneficial effects to SWHA because the restoration activities would increase the extent of riparian habitat which provides suitable nesting habitat for SWHA.

White-tailed Kite is a state Fully Protected species. Suitable nesting and foraging habitat is present in the Project Area and nesting is known within the Napa River Ecological Reserve (Horizon 2013). If present, temporary construction-related activity could generate noise and visual distractions that could disturb nesting and potentially cause failure of a nest, which would be considered a significant impact.

The Proposed Project incorporates measures to avoid and minimize impacts to White-tailed Kites. EC-BIO18 listed in Table 2-11includes pre-construction surveys for nesting raptors. In the event that an active nest is found during surveys, a minimum of 0.25-mile no work buffer will be established around the nest until the young have fledged or the nest becomes inactive. If White-tailed kite nest trees are proposed for removal, the County will implement Mitigation Measure BIO-2a and BIO-2b. With the implementation of these measures, impacts to White-tailed Kite would be reduced to a less than significant level.

Yellow Warbler is riparian obligate species that was historically common in the area, but numbers have declined locally and across the state (Heath 2008, Horizon 2013). Yellow Warblers require relatively broad riparian corridors with a diverse age structure of broad-leaved, deciduous riparian trees (e.g., willows, alders and cottonwoods). Recruitment of willows, as provided by sandbars in an active floodplain, is apparently a critical habitat component in Central/North Coast regions (Evens, pers. obs.). Breadth of the stream course and the pattern of sediment deposition that promotes active recruitment of willows and alders benefit Yellow Warblers as well as other neo-tropical migrants. Additionally, peripheral vegetation (shrubbery) that "softens" the transition between riparian and upland enhances the value of the riparian corridor by providing additional cover (Horizon 2013)

Moderately suitable nesting habitat is present in the Project Area and nesting is known within the Napa River Ecological Reserve (Horizon 2013). If present, temporary construction-related activity could generate noise and visual distractions that could disturb nesting and potentially cause failure of a nest, which would be considered a significant impact. The Proposed Project incorporates measures to avoid and minimize impacts to Yellow Warbler and other passerine species. EC-18BIO listed in Table 2-11 includes pre-construction nesting bird surveys. In the event that an active nest is found during surveys, a minimum of a 500-foot no work buffer will be established around the nest until the young have fledged or the nest becomes inactive. With the implementation of these measures, impacts to Yellow Warbler would be reduced to a less than significant level. Therefore, no mitigation is required.

In the long-term, the Proposed Project is expected to have beneficial effects to SWHA and White-tailed Kite because it will expand riparian habitat that is suitable for nesting. The Proposed Project is expected to have substantial beneficial effect to Yellow Warbler because it will expand the width of the riparian corridor in several locations and create early seral riparian habitats on floodplains which provide high quality nesting habitat for this species.

Mammals

The Project Area provides suitable habitat for special-status bat species including western red bat, pallid bat (*Antrozous pallidus*), and Townsend's big-eared bat (*Corynorhinus townsendii*). These bat species may utilize structures in the vicinity of the Project Area or hollow trees within the restoration sites as roosts or maternal colonies. Adjacent vineyards provide high quality foraging habitat. Removal of trees or structures with an active maternity colony or roost of special-status bat species would be considered a significant impact.

EC-23BIO listed in Table 2-11 specifies measures which would avoid or minimize impacts to special-status bat species. These measures include pre-construction surveys for roost sites, methods to minimize impacts to active roosts during construction, and protocols to mitigate for unavoidable impacts to special-status bats. With the implementation of these measures, impacts to special-status mammals would be reduced to a less than significant level. Therefore, no mitigation is required.

In the long-term, the Proposed Project is not expected to have substantial negative or beneficial effects to special-status bats because Project activities are not anticipated to substantially improve or degrade habitat for these species.

b. Have a Substantial Adverse Effect on Any Riparian Habitat or Other Sensitive Natural Community — *Less Than Significant with Mitigation*

Sensitive natural communities that would be affected by the Proposed Project include various wetland, upland and riparian habitats. Wetlands are addressed separately in section (c) below. Implementing channel widening, floodplain restoration, biotechnical stabilization, in-stream habitat structures, managed streambank retreat, and vegetation management would impact approximately 55 acres of riparian and upland habitat. Approximately 260 trees over 12 inches diameter at breast height (DBH) would be removed, many of them native species. The understory of the riparian habitat contains a mixture of native and non-native species. Dominant native species in the Project Area include Santa Barbara sedge, California rose, common snowberry, California blackberry and wild grape.

Currently, riparian habitat in the Project Area is dominated by relatively even-age stands of mature riparian forest. Due to the geomorphic condition of the river, these habitats are relatively static with little opportunity for natural disturbance and recruitment, expect for severe bank erosion, which takes a very long time to recruit riparian habitat under natural conditions. The Proposed Project would restore floodplain function at select restoration sites. This would enable creation of early seral riparian habitat that is prone to natural disturbance by flooding. This habitat type is severely underrepresented along the river and was historically much more prevalent prior to widespread channel incision. These types of early seral, scrub/shrub dominated habitat, along with the expanded riparian corridor,

would provide important habitat for riparian obligate passerine species such as Yellow Warbler. Early and mid-seral riparian habitats will also provide habitat heterogeneity and "patchiness" along the riparian corridor which is likely to increase species diversity.

Nevertheless, the Proposed Project's impact to riparian habitat would be considered "long-term" because the impacts would persist for greater than 1 year. The Proposed Project would offset these impacts by restoring approximately 84 acres of riparian and aquatic habitats. This includes conversion of approximately 36 acres of vineyards to natural areas, much of which would be restored to riparian habitat and floodplain habitat. Approximately, 42 acres would be new "lowered" floodplain habitat that would experience a greater frequency of inundation and overall floodplain connectivity. Revegetation of both under- and overstory species would be conducted in all graded and disturbed areas as well as where vegetation management is prescribed. Microsites will be identified within each restoration site based on elevations and proximity to the stream. Within each microsite or zone, a high density of pioneer species adapted to the specific environmental conditions will be installed. For example, new floodplains, benches and widened channel banks would be planted with native species specifically adapted to the soil type and expected hydrologic regime. The revegetation effort aims to quickly establish canopy cover through the planting of pioneer species at a high density throughout the Project. When established, plantings will reduce flow velocities, increase bank stability, provide new sources of large woody debris, create high-flow refugia for native fish, and enhance habitat for other species that utilize the riparian corridor. The Project includes an extensive monitoring and adaptive management plan to ensure the success of the revegetation efforts (see description in Chapter 2 *Project Description*.)

Over the long term, Project maintenance could require pruning, thinning, limited removal of trees and riparian vegetation, and grading and bank stabilization for managed streambank retreat. Any such activities would be restricted to the minimum necessary to maintain the functions of the channel and constructed project features and would incorporate the same Environmental Commitments s to protect special-status species as is required during Project construction. Over the long term, the Project would have a beneficial effect on riparian habitats. However, impacts due to removal of vegetation during construction or maintenance activities would result in a long-term (more than one year) loss of certain riparian functions and values of riparian habitat which would be potentially significant. The conversion of approximately 36 acres of vineyards to natural areas would partially offset this impact. Implementation of Mitigation Measures BIO-3a and BIO-3b would reduce impacts to riparian habitat to a level that is less than significant by surveying pre-Project conditions, avoiding impacts where feasible, and creating an additional 10% of restored riparian habitat.

Mitigation Measure BIO-3a: Document Riparian Habitat Impacts and Identify Preservation and Salvage Opportunities

Prior to and following each construction season, the County shall document the extent of riparian habitat that would be disturbed in the Project Area during construction. Disturbance of riparian habitat shall be defined as a reduction of absolute coverage by 30% or greater in the tree or shrub stratum. Removal of riparian habitat dominated by Himalayan blackberry (with no overstory) and Arundo will not be counted as removal of riparian habitat. During pre-construction surveys the County will identify opportunities for plant salvage (e.g., Santa Barbara

sedge) and transplant species to restoration sites. A qualified biologist will survey the limits of grading and identify opportunities for preservation of riparian habitat. The County shall submit annual reports to CDFW documenting the extent of disturbance and preservation measures.

Mitigation Measure BIO-3b: Restore and Monitor Riparian Habitat

For each acre of riparian habitat that is disturbed in the Project Area, the County shall restore 1.1 acres of habitat within 10 years following construction. Restored habitat shall contain a minimum absolute coverage of 60% in the tree stratum and 30% cover in the shrub stratum within 10 years. The restored habitat shall contain a minimum of three native woody vines, shrubs or trees species that individually account for at least 10% cover. Remedial actions, such as replanting, will be implemented to ensure that the cover objectives are met. The County shall submit annual reports for 10 years to CDFW documenting the extent of riparian habitat restored.

c. Substantial Adverse Effects on Federally Protected Wetlands — *Less Than Significant Impact*

Construction of flood benches, alcoves, and instream habitat features (e.g., large wood structures, grade control, roughness boulders) would result in excavation and placement of fill in jurisdictional waters of the U.S. and removal of vegetation within areas that are potentially jurisdictional wetlands. Project activities are not expected to result in loss of waters or wetlands, nor conversion of wetland type.

Following construction, recontoured banks and inset terrace/floodplain surfaces would be replanted with native overstory and understory riparian species, eventually replacing and improving the functions and values currently offered by the mixed native and non-native vegetation in existing in-channel wetlands. Creation of new inset surfaces below the Ordinary High Water Mark would also facilitate sediment deposition and trapping of native seed material and natural recruitment of riparian vegetation, potentially increasing the extent and stability of in-channel and channel-marginal wetland areas. Although some wetland areas would be temporarily disturbed or removed during project construction, the Project is expected to benefit wetlands overall by increasing their extent, as well as improving functions and values.

Over the long term, Project maintenance could result in disturbance or removal of wetland vegetation. However, as discussed above, any removal of wetland vegetation would be restricted to the minimum necessary to maintain the functionality of the channel and the constructed project features, and would incorporate the Environmental Commitments s to protect special-status species required during project construction. Over the long term, the Project would have a beneficial effect on wetlands. Temporary impacts due removal of vegetation during construction or maintenance activities are expected to have a less than significant impact to federally protected wetlands.

d. Substantial Interference With Wildlife Movement, Established Wildlife Corridors, or the Use of Native Wildlife Nursery Sites — *Less Than Significant with Mitigation*

The California Wilderness Coalition's CalWild Linkages Map has identified the Napa River as a wildlife corridor (Napa County 2005). It is an important north-south corridor for riparian species as well as for fish species moving from the San Francisco Bay to the upper Napa River watershed. Project construction and maintenance would incorporate a variety of measures to avoid or minimize adverse effects to movement and reproduction of fish and wildlife resources. Specifically, the Proposed Project incorporates seasonal restrictions (Table 2-11, EC-1GEN) on most activities to avoid sensitive migration and breeding times. For activities that do occur during the breeding season for migratory species, pre-construction surveys are required to identify nest sites and subsequently minimize disturbance to active nests or breeding sites (Table 2-11, EC-18BIO, and ECBIO). These measures would reduce wildlife movement-related impacts to fish, amphibians, reptiles, and birds to a level that is considered to be less than significant.

Mammal species that may use the Napa River's riparian area as a year-round movement corridor or nursery site include, but are not limited to, dusky-footed woodrat, black-tailed deer, bobcat, gray fox (*Urocyon cinereoargenteus*), ringtail (*Bassariscus astutus*), coyote (*Canis latrans*) and mountain lion (*Puma concolor*). Potential impacts to the movement or reproduction of these species are discussed below.

Dusky-footed woodrats are common in California (Brylski 2008). The current taxonomy of *Neotoma fuscipes* recognizes 11 subspecies within the species' range, which extends from northern Oregon to northern Baja California (Matocq, 2002). Woodrats along the southern edge of San Francisco Bay, from San Francisco south along the San Francisco Peninsula into Santa Clara County and up the east shore of the bay, are currently recognized as San Francisco dusky-footed woodrats (*N.f. annectens*), which are a California species of special concern. The range of this subspecies does not extend to the north side of the Bay. The subspecies that occurs in the Project Area belongs to the northern California and Oregon group of subspecies (*N. fuscipes fucipes*), which are not designated as a species of special concern by the CDFW. However, Fish and Game Code § 4150 affords protection to nongame mammals, and under CEQA substantial interference with wildlife movement could be considered a significant impact.

Dusky-footed woodrats were observed to be relatively common along the Rutherford Reach of the Napa River. The woodrats build houses constructed primarily of sticks, but other types of man-made debris are often incorporated into the structures. The houses tend to be 3 to 7 feet in diameter and approximately 3 feet in height. The houses are situated along the banks of the river, ranging in elevations from several feet above ordinary high water to the top of bank. Houses tend to be associated with riparian forest dominated by oaks (*Quercus* spp.). Several houses (3 to 5) are often constructed in close proximity to one another (Personal observation, Fisher 2012).

Cranford (1977) found that the home ranges for dusky-footed woodrats in Sonoma County averaged 0.58 ac for males, 0.48 ac for females, and 0.43 ac for juveniles. The restoration sites range in size from approximately 0.5 acres (Site 11) to 17 acres (Site 14 with expanded grading option), with most sites in the 1 to 4 acre range. This indicates that removal of

riparian habitat within an individual restoration site could eliminate the home range for a dusky-footed woodrat. If dusky-footed woodrats are present within or near the margins of a restoration site, the Proposed Project could substantially interfere with the movement and reproduction of individuals. Implementation of Mitigation Measures BIO-4a through BIO-4c would reduce construction-related impacts to a level that is less than significant. It is important to note that implementation of the Proposed Project is not likely to cause a significant decline in the local dusky-footed woodrat population. Furthermore, over the long term, the Project would have a beneficial effect on the movement of wildlife and the availability of nursery sites for wildlife species, including the dusky-footed woodrat and bobcat.

Mitigation Measure BIO-4a: Conduct Pre-construction Survey for Dusky-footed Woodrat Houses

No less than 30 days and no more than 90 days prior to the beginning of ground disturbance and/or construction activities, a qualified biologist will survey the work areas scheduled for construction. The survey shall cover the work area and a 50-foot buffer in the upstream and downstream directions. Any dusky-footed woodrat houses found shall be marked in the field with flagging tape and their locations will be recorded with GPS. If a dusky-footed woodrat house is identified in a work area, Mitigation Measure BIO-4b will be implemented by the County.

Mitigation Measure BIO-4b: Avoid or Minimize Disturbance to Dusky-footed Woodrat Houses

If a dusky-footed woodrat house is identified in a work area, the County shall attempt to preserve the house and maintain an intact dispersal corridor between the house and undisturbed habitat. An adequate dispersal corridor would be considered to be a minimum of 50 feet wide and have greater than 70% vegetative cover. If a dusky-footed woodrat house(s) cannot be avoided, Mitigation Measure BIO-4c will be implemented by the County.

Mitigation Measure BIO-4c: Implement a Dusky-footed Woodrat Relocation Measure

If a dusky-footed woodrat house(s) cannot be avoided, CDFW will be notified and information regarding the house location(s) and relocation plan will be provided. With approval from CDFW, a qualified biologist shall dismantle and relocate the house material. No less than 10 days prior to the beginning of construction a qualified biologist shall deconstruct the house by hand. Materials from the house shall be dispersed into adjacent suitable habitat that is outside of the work area. During the deconstruction process the biologist shall attempt to assess if there are juveniles in the house. If immobile juveniles are observed, the deconstruction process shall be discontinued until a time when the biologist believes the juveniles will be fully mobile. A 50-foot wide no-disturbance buffer will be established around the house until the juveniles are mobile. The house may be dismantled once the biologist has determined that adverse effects on the juveniles would not occur. All disturbances to woodrat houses will be documented in a construction monitoring report and submitted to CDFW.

Ringtails are a state Fully Protected species**.** Ringtails are commonly associated with riparian woodland habitats and are potential year-round residents of riparian areas within Napa County (Napa County 2005). The presence and abundance of this species in the

Project Area is not known. This species typically nests in rock recesses and tree hollows, the latter being common in the Project Area, and the former being virtually absent. The ringtail is nocturnal and elusive, so sightings are rare. In California, home ranges are estimated to vary from 109 to 1,280 acres (Grinnel et al. 1937, CWHR 2005).

Clearing of riparian habitat during construction of the Proposed Project has the potential to impact the movement, nesting, and foraging opportunities for ringtails. If present in the Project Area, these impacts would be considered potentially significant. EC-24BIO includes measures to minimize impacts to ringtails including pre-construction surveys for nests in snags and crevices. However, given the relatively small home range of this species, removal of cover could result in significant impacts. Mitigation Measure BIO-5 would create cover elements in restoration sites and reduce construction-related impacts to a level that is less than significant.

> **Mitigation Measure BIO-5: Create Cover Elements for Small and Medium Size Mammals.**
> For every 0.5 acres of riparian habitat disturbed during construction the County shall create one cover element within the disturbed area. The cover elements may include slash piles, retained snags or riparian habitat "islands, or constructed boulder/log clusters. Cover elements shall encompass at least 250 square feet per 0.5 acres. To create cover or hiding places for small and medium size mammals, materials will be arranged to create crevices or recesses within the piled materials. The cover elements will remain in-place permanently and be incorporated into revegetation planting designs such that the restored area is diverse and heterogeneous.

Bobcat, Coyote, Gray Fox, and Mountain Lion. There are no quantitative data available to ascertain the presence or abundance of these species in the Project Area. Bobcats and coyotes are likely common in the Project Area as evidenced by sightings and numerous scat observations. Mountain lions are likely uncommon on the valley floor, but may occasionally utilize the riparian corridor for hunting. Mountain lions are more likely to den and hunt in the oak woodlands and shrublands flanking the valley. Similarly, gray fox are thought to be uncommon in the Project Area, as they are typically associated with shrublands and open-canopied forests.

Bobcats and coyotes are habitat generalist, and may use portions of the Project Area for movement, hunting, and denning. However, most of the restoration sites are characterized by steep embankments that are not suitable for movement or denning. Monitoring conducted in 2012 in the Rutherford Reach suggested that bobcats intermittently used the riparian corridor for movement, but were not denning in the riparian area (Horizon 2012). Within the Project Area, bobcats and coyotes animals are likely moving along the margins of the riparian corridor on vineyard roads as evidenced by numerous scat observations along the roads.

Construction of the Proposed Project has the potential to impact the movement and denning of bobcats and coyotes by clearing riparian vegetation that provides cover and potential den sites. EC-24BIO includes measures to minimize impacts to bobcats and coyotes including pre-construction surveys for dens, maintaining an intact dispersal corridor between dens and undisturbed habitat, and blocking dens prior to construction to discourage usage, if necessary. No disturbance of active dens would take place when cubs may be present and

dependent on parental care. Disturbance of mountain lion and gray fox dens is not expected to occur. Since there are few, if any, predators of these animals, removal of cover may result in impacts (e.g., decreased success in hunting), but not to a level that would be considered significant. Moreover, these animals have relatively large home ranges and disturbance of individual restoration sites is not likely to comprise a significant portion of their hunting territory. Therefore, the impacts are considered to be less than significant.

Black-tailed Deer are commonly associated with early to intermediate successional stages of forest, woodland, and brush habitats. They prefer a mosaic of various-aged vegetation that provides woody cover, meadow, and shrubby openings (CWHR 2006). The relatively even-aged, mature riparian habitat that is common throughout much of the Project Area generally provides low quality habitat for black-tailed deer. Restoration Site 6 is an exception to this, as this site provides early seral meadow/shrub habitat that is ideally suited to this species as it provides good foraging and cover, and is suitable for fawning. Black-tailed deer may also forage in the ecotones between the riparian forest and vineyards.

Construction of the Proposed Project is not expected to substantially interfere with the movement of black-tailed deer because the species is generally habituated to human activity and the Proposed Project would not disrupt movement corridors. Temporary construction fencing is not likely to pose a movement barrier to this species. However, construction activities could disrupt nursery sites if fawning habitat is disturbed during the fawning season (i.e., April through June). Impacts to fawning would be considered potentially significant. Mitigation Measure BIO-6 would reduce construction-related impacts to a level that is less than significant.

Mitigation Measure BIO-6: Avoid Clearing of Black-tailed Deer Fawning Habitat during the Fawning Period.
Prior to commencing construction, a qualified biologist shall survey the Project Area to assess the site for suitability for black-tailed deer fawning. If fawning habitat is present, no clearing of vegetation within a 250-foot buffer around the potential fawning area shall take place between April 1 and July 15.

e. Conflicts With Local Policies or Ordinances Protecting Biological Resources — *No Impact*

The County General Plan contains numerous goals, policies, and action items to protect biological resources. The Proposed Project incorporates a variety of measures to avoid or minimize adverse effects to sensitive habitats, wildlife, and fisheries resources. Additionally, in-channel and riparian habitat and stream-dependent wildlife would benefit from the Project over the long-term. Thus, the Project is consistent with the General Plan's priority on conservation of biological resources, and there would be no impact related to conflicts with local policies or ordinances for biological protection. No mitigation is required.

f. Conflict With the Provisions of an Adopted HCP, Natural Community Conservation Plan — *No Impact*

The Project Area is not subject to any adopted habitat conservation plan, natural communities conservation plan, or other approved local, regional, or state habitat conservation plan. Consequently, there would be no impact related to potential conflicts with the provisions of any such plan, and no mitigation is required.

3.5 CULTURAL RESOURCES

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the Project:					
a.	Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 of the State CEQA Guidelines?	☐	☒	☐	☐
b.	Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5 of the State CEQA Guidelines?	☐	☒	☐	☐
c.	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d.	Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

Regulatory Setting

Cultural and paleontological resources are protected by the National Historic Preservation Act, the California Environmental Quality Act, and the California Public Resources Code. The Napa County General Plan also contains goals and policies to protect the County's archaeological and historical resources.

Ethnographic Setting

The following is an abbreviated discussion of the relevant information contained in the Cultural Resources chapter of the Napa County BDR.

Native American Period

Archaeological records show that the Napa region was inhabited primarily by the Wappo, Lake Miwok, and Patwin tribal groups. These tribes shared similar lifestyles, technologies, subsistence strategies, and settlement patterns. The territorial boundaries of the Wappo tribe extended from just north of Napa and Sonoma, northward along the valley floor to Cloverdale on the west and Middletown on the east. The Lake Miwok inhabited an area that extended south from Clear Lake to Pope Valley, west to Cobb Mountain in Lake County, and east to the boundaries of the Patwin territory. The Patwin inhabited an extensive region within north-central California that included the lower portion of the western Sacramento

Valley, west of the Sacramento River from about Princeton in the north to Benicia in the south.

Hispanic and American Periods

In 1823 the first European explorers, Don Francisco Castro and Franciscan Friar Jose Altamira, traveled through Napa Valley in search of a site for a new mission. They explored present-day Petaluma, Sonoma, and Napa before settling on Sonoma as the location for the mission.

In the 1830s, the Napa Valley became one of the first areas in California to be settled by American farmers. George C. Yount was the first pioneer to settle in Napa County. Yount, who came to California in 1831 to hunt and trap sea otters, received a land grant in the Napa Valley from the Mexican government. Rancho Caymus encompassed more than 11,000 acres and extended north from the western foothills of Mt. St. John to what is now the intersection of Zinfandel Lane and Silverado Trail. From 1836 to 1846, most of the Rancho was used for grazing horses, cattle, and sheep, with a small portion set aside for cultivating wheat.

When California was granted statehood in 1850, Napa was part of the district of Sonoma. Later that year, when counties were established throughout the state, Napa became one of the original 27 California counties, with Napa City (later shortened to Napa) as the County seat.

The Spanish and Mexican missionaries are credited with planting the first grapevines and introducing winemaking to California. In 1838 the first grape vines in Napa Valley were planted by George Yount. While Yount is considered the first to plant table grapes in Napa Valley, it was Agoston Harazthy who made the first effort to improve the variety of planted grapes, growing techniques, and winemaking. Harazthy introduced zinfandel into California in 1852 and also planted additional European varietals in the Napa Valley in the 1860s.

The wine industry continued to grow in Napa Valley during the 1870s, with the number of wineries between Calistoga and Oakville doubling from 15 to 30. Since then, the wine industry weathered a series of highs and lows — phylloxera infestations, the San Francisco earthquake of 1906, Prohibition, the economic crisis of the Great Depression — however viticulture remained the dominant agricultural activity in Napa Valley. Rising from the problems that faced the wine and wheat industries during the late 1800s, fruit growing (mostly apples, peaches, olives, and prunes) became important secondary crops in the valley.

Existing Conditions

Cultural Resources

A request was made for a Sacred Lands Inventory for the Project Area from the Native American Heritage Commission (NAHC) in Sacramento. A reply was received on December 19, 2012 indicating that no known Native American resources were on file with the NAHC.

A records search was conducted at the Northwest Information Center at Sonoma State University, the central repository for archaeological information on the 11 counties around

the San Francisco Bay Area, for archaeological resources in the proposed 23 restoration sites within the Project Area (Pacific Legacy 2013). As discussed in Appendix F and summarized in **Table 3.5-1**, eleven of the proposed restoration sites have been the subject of varying levels of archaeological survey. Prehistoric archaeological resources have been reported within or immediately adjacent to five of these proposed restoration sites.

Table 3.5-1. Known Archaeological Sites within the Project Area

Restoration Site	Documented Resources within Parcels	Area Surveyed?	Resource Description
1	None	Yes (Flaherty 2004), Negative	CA-NAP-0007, a prehistoric lithic scatter, was reported to be at confluence of Dry Creek and Napa River or confluence of Hopper Creek and Dry Creek. Site not relocated during survey.
2	None	Part of parcel (Flaherty 2004), Negative	None noted
3	None	No	None noted
4	None	No	None noted
5	None	No	None noted
6	None	No	None noted
7	None	No	None noted
8	None	No	None noted
9	CA-NAP-0006 P-28-000019	May have included part of Stoll (1960) survey area. Not clear from report.	First recorded in 1923 (Stephens 1923a). Was not relocated during 1960 survey of area (Stoll (1960). Very little descriptive information. Site record notes arrowpoint and pestles reported from the site.
10	None	No	Close to reported location of CA-NAP-6
11	None	No	None noted
12	None	No	None noted
13	None	No	None noted
14	None	No	None noted
16	None	No	None noted
17	None	No	None noted
18	None	Stream survey by Burns et al. (2006).	None noted
19	None	Stream survey by Burns et al. (2006).	None noted
20	P-28-001404	Stream survey by Burns et al. (2006).	Prehistoric isolate, two obsidian bi-face fragments and flakes. Non-cultural obsidian cobbles noted (Rich 2006).
21	None	Unclear from report whether parcel was surveyed (Flynn 1988)	Noted flakes, historic debris scatter nothing recorded as a resource

Restoration Site	Documented Resources within Parcels	Area Surveyed?	Resource Description
22	None	Unclear from report whether parcel was surveyed (Flynn 1988)	Noted flakes, historic debris scatter, nothing recorded as a resource
23	None	No	None noted

Source: Pacific Legacy 2013 (See Appendix F)

While some of the reports can be used to determine the adequacy of survey efforts (Flaherty 2004; Burns et al. 2006), documentation for most the proposed restoration sites where survey is reported have only been partially surveyed or descriptions and/or mapping of the survey areas is minimal or unclear. Several reports would not be acceptable by today's standards or they are outdated (Stoll 1960; Flynn 1988). At proposed restoration Sites 20 through 16, survey was focused along the stream bank and not onto the floodplain. Perhaps the biggest deficiency in the reporting is a clear definition of what constitutes a prehistoric site. In several instances it was noted that obsidian flakes, generally a marker of prehistoric activity, were noted during the surveys but were not recorded. Conversely, another researcher recorded several obsidian flakes and a formed flake tool as an isolated resource.

In addition to natural forces (e.g., flooding), agricultural practices (e.g., leveling, grading, vineyard preparation) have redistributed cultural materials on the developed terraces above the stream channel; therefore, there may be some confusion as to what constitutes a prehistoric resource based on the presence and absence of obsidian debitage alone. Lastly, emphasis on addressing potential for buried resources has become standard within the last five years. This would include a geomorphological analysis based on soil types and age to determine the potential for buried resources. For the most part, this has not been completed for past studies within the Oakville to Oak Knoll Reach of the Napa River. The remaining proposed restoration sites have not been the subject of archaeological survey.

Paleontological Resources

The term "paleontological resources" refers to the fossilized remains of vertebrate and invertebrate organisms, fossil tracks and trackways, and plant fossils. The paleontological sensitivity of the Project Area was evaluated using the criteria of the Society of Vertebrate Paleontology (SVP). The SVP's Conformable Impact Mitigation Guidelines Committee developed guidelines (SVP 1995) in response to a recognized need for standardized methods to assess and mitigate impacts on paleontological resources. Because the majority of fossil materials are buried in subsurface geologic units rather than exposed at the ground surface, assessment and mitigation strategies for paleontological resources are based on probabilities of discovery. Based on the anticipated sensitivity of a particular project location, general strategies supporting adaptive management are developed. **Table 3.5-2** defines the SVP's sensitivity categories for paleontological resources.

Table 3.5-2. Society of Vertebrate Paleontology Sensitivity Criteria

Sensitivity Level	Definition
High	Geologic units from which vertebrate or significant fossils or suites of plant fossils have been recovered.
Undetermined	Geologic units for which little information is available.
Low	Geologic units that are not known to have produced a substantial body of significant paleontologic material.

Source: SVP 1995

As used in the table above, the term significant refers to paleontological resources that fulfill one or more of the following criteria (SVP 1995):

- Provides important information shedding light on evolutionary trends and helps to relate living organisms to extinct organisms;
- Provides important information regarding the development of biological communities;
- Demonstrates unusual circumstances in the history of life;
- Represents a rare taxon or a rare or unique occurrence; is in short supply and in danger of being destroyed or depleted;
- Has a special and particular quality, such as being the oldest of its type or the best available example of its type; and
- Provides important information used to correlate strata for which it may be difficult to obtain other types of age dates.

Vertebrate fossils are typically considered significant and other types of materials (invertebrates, plants, trace fossils) may also qualify (SVP 1995).

All Proposed Project earthwork is expected to be confined to the ribbon of latest Holocene alluvial deposits along the active Napa River corridor. Although exceptions are made for materials of particular scientific importance, biological remains younger than 10,000 years are not typically considered paleontologically significant. Because of their geologic youth, the Holocene deposits of the Napa River are evaluated as having low sensitivity for paleontological resources.

Discussion of Checklist Responses

a,b. Adverse Change in Significance of Archaeological or Historic Resources — *Less than Significant with Mitigation*

Construction

As described above in *Ethnographic Setting* above, the Project Area has been under active cultivation and has experienced ongoing ground disturbance for over 100 years. However, previous agricultural disturbance does not necessarily affect the significance of an archaeological resource. Eight of the 23 Project Sites have previously been the subject of archaeological surveys. Ethnographic investigations in the Project Area have identified five known archaeological sites along the banks of the Oakville to Oak Knoll Reach. The remaining parcels have not been surveyed. Ground disturbing activities conducted for the Project have the potential to disturb known cultural resources. In addition, ground disturbance associated with the Project's activities could adversely impact previously undiscovered important archaeological or historic resources. Project activities could result in alteration of the elements of these resources that make them eligible for the California Register of Historical Resources (CRHR), or could result in a substantial change in the significance of a historical resource. The majority of the Project's activities would be conducted in the floodplain or stream channels. Resources may have been destroyed during channel reconstruction or historic agricultural activities. Nevertheless, stream channels and the floodplain are areas that are considered highly sensitive for the presence of cultural resources.

Depending on the extent and severity of disturbance and the nature of the materials affected, impacts on cultural resources, including unknown buried resources, could be significant. Impacts would be reduced to a less than significant level by implementation of the following mitigation measures.

Mitigation Measure CUL-1: Conduct Archaeological Investigations
Prior to project implementation, the proponent shall retain a qualified archaeologist to formally survey and conduct preliminary archaeological testing (rapid recovery units or similar) to better determine the integrity and extent of the known archaeological site within the Project Area. If archaeological deposits are found to be significant, a program of data recovery in areas of proposed disturbance shall be implemented.

Mitigation Measure CUL-2: Monitor Construction Activities
The proponent shall retain a qualified archaeologist, as well as a Native American monitor, who shall be present onsite during any ground disturbing activities within or adjacent to known archaeological sites. If any cultural resources are discovered during these or any other Project activities, *Mitigation Measure CUL-3* shall be implemented.

Mitigation Measure CUL-3: Stop Work if Cultural Resources Are Discovered During Project Activities
If buried cultural resources, such as chipped or ground stone, historic debris, building foundations, or human bone are discovered during ground disturbing

activities, work shall stop in that area and within 100 feet of the find until a qualified professional archaeologist can assess the significance of the find and develop appropriate treatment measures in consultation with the County, and other appropriate authority. The County shall be responsible for ensuring that the treatment measures are properly implemented.

Maintenance

Because of the long record of human occupation in the area there is some potential for the Project's maintenance activities to disturb previously unknown cultural resources. Depending on the extent and severity of disturbance and the nature of the materials affected, impacts could be significant, but would be reduced to a less than significant level by implementation of Mitigation Measures CUL-2 and CUL-3, described above. No additional mitigation is required.

c. Destruction of Unique Paleontological Resource — *No Impact*

All areas proposed for ground-disturbing activity associated with the Project's construction and maintenance are situated on substrate of Holocene age, and thus are not considered sensitive for paleontological resources. As a result, no impact on paleontological resources (including unique paleontological resources) is anticipated, and no mitigation is required.

d. Disturbance of Human Remains — *Less than Significant with Mitigation*

Construction

As discussed under *Impact a,b, Adverse Change in Significance of Archaeological or Historic Resources,* above, although the Project Area has experienced ongoing ground disturbance as a result of vineyard activities, previous investigations have documented important archaeological resources along the banks of the Oakville to Oak Knoll Reach. Additionally, because of the long record of human occupation in the area there is some potential for construction activities to disturb previously unknown cultural resources, including human remains. Any disturbance of human remains would represent a significant impact. Impacts would be reduced to a less than significant level by implementation of the following mitigation measure, designed to ensure consistency with state law regarding the treatment of human remains (Pub. Resources Code § 5097).

Mitigation Measure CUL-4: Protect Human Remains, Consistent with California State Codes

1. In the event of discovery of human remains (or the find consists of bones suspected to be human), the field crew supervisor shall take immediate steps to secure and protect such remains from vandalism during periods when work crews are absent.
2. Immediately notify the Napa County Coroner and provide any information that identify the remains as Native American. If the remains are determined to be from a prehistoric Native American, or determined to be a Native American from the ethnographic period, the Coroner shall contact the Native American Heritage Commission (NAHC) within 24 hours of being notified of the remains, per California Public Resources Code section 5097.98. The NAHC then designates and notifies within 24 hours a Most Likely Descendant (MLD). The MLD has 24

hours to consult and provide recommendations for the treatment or disposition, with proper dignity, of the human remains and grave goods.

3. Preservation in situ is the preferred option. Human remains shall be preserved in situ if continuation of the maintenance work, as determined by the Consulting Archaeologist and MLD, will not cause further damage to the remains. The remains and artifacts shall be documented and the find location carefully backfilled (with protective geo-fabric if desirable) and recorded in County project files.
4. Human remains or cultural items exposed during maintenance that cannot be protected from further damage shall be exhumed by the Consulting Archaeologist at the discretion of the MLD and reburied with the concurrence of the MLD in a place mutually agreed upon by all parties.

Maintenance

Because of the long record of human occupation in the area, there is some potential for the Project's maintenance activities to disturb previously unknown cultural resources, including human remains. Any disturbance of human remains would represent a significant impact. Impacts would be reduced to a less than significant level by implementation of *Mitigation Measure CUL-4*, described above. No additional mitigation is required.

3.6 GEOLOGY AND SOILS

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the Project:					
a.	Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
	1. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
	2. Strong seismic ground shaking?	☐	☐	☒	☐
	3. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
	4. Landslides?	☐	☐	☐	☒
b.	Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c.	Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the Project and potentially result in an on-site or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☒	☐
d.	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e.	Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems in areas where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

The geologic setting for the Proposed Project is based on the Geological Resources Chapter of the Napa County BDR (Napa County 2005) and a geology and soils report prepared for the Proposed Project (A3GEO 2013), which is included in Appendix G.

Environmental Setting

Napa County is located in the Coast Ranges geomorphic province, which is bounded on the west by the Pacific Ocean and on the east by the Great Valley geomorphic province. The physical structure of Napa County is generally described as having a series of northwest-southeast trending mountain ranges and intervening valleys. The mountain ranges include steep rugged terrain and ridgelines that separate the ranges into separate watersheds. The larger watersheds typically have headwater areas in the upper mountain zones with multiple tributaries that coalesce into a principal stream course that emerges onto the valley floor. In Napa County, this physical structure, along with the local climate, soils, and hydrology has led to the high agricultural productivity of the region, including its production of premium wine grapes. The County's highest topographic feature is Mount St. Helena (elevation 4,343 ft.), located in the northwest corner of the County. Napa Valley is the main valley in the County, extending southeast along the west side of the County to near the edge of San Pablo Bay. The Napa Valley contains the Napa River, the principal drainage course in the County, which has numerous tributary streams that drain its flanking ridge systems. The Proposed Project is located on the floor of the mid Napa Valley region.

Nearby Faults and Seismicity

As referenced in the geology and soils report prepared for the Proposed Project (A3GEO 2013) the closest major active faults to the Project Area include the Green Valley fault located approximately 6 miles to the southeast and the Rogers Creek fault zone located approximately 16 miles to the southwest (Jennings and Bryant, 2010). There is a small portion of the West Napa fault identified as active which is located approximately 4 miles to the south (near the Napa Airport). Other major faults in the region include the Soda Creek fault (approximately 3 miles east of the Proposed Project), the Maacama fault (approximately 25 miles northwest), the Hunting Creek fault (approximately 27 miles northeast), and the San Andreas fault (approximately 35 miles west) (Jennings and Bryant, 2010). The Project Area is not within an Alquist-Priolo Earthquake Fault Zone as designated by the State of California for active faults and no active faults have been mapped in the direct vicinity of the Project Area (Bryant, 1982; Hart and Bryant, 1997; and Wesling and Hanson, 2008).

The chance for a magnitude 6.7 or larger earthquake to occur in the greater Bay Area by the year 2032 is 63%. It is estimated that earthquakes between magnitudes 6.0 and 6.7 have an 80% chance of occurrence by 2032. Earthquakes of these sizes are capable of considerable damage depending on epicenter proximity. Seismic risk is not isolated to active faults within Napa County; damage can result from activity on one of the major faults located outside of the County (such as the San Andreas fault, or Hayward fault in the East Bay). (Jennings and Bryant, 2010)

Tsunami and Seiche Risk

Due to the relative coastal protection of San Pablo Bay, and the up-valley distance to the Project Area away from the Bay, tsunamis pose little risk to the Project Area. There would be no risk for seiche because the Project encompasses a river channel that would not create a standing wave during a seismic event.

Soils

The active Napa River channel and its immediate streambanks as active geomorphic zones typically show very minimal soil development. However, along the floodplain areas adjacent to the river channel there are well developed soils, and as described above; these soils can be very highly productive. The upper terraces of the historic Napa River floodplain are underlain by soils assigned to the Yolo loam, 0–2% slopes, which formed in recent alluvium (Lambert and Kashiwagi 1978). The surface layer of this soil unit is about 24 inches thick and typically consists of dark grayish brown and very dark grayish brown slightly acid to neutral loam and silt loam. Underlying materials consist of dark grayish brown, brown, and dark brown neutral to slightly alkaline silt loam, to a depth of 60 inches or more. Yolo soils are well-drained and moderately permeable. Runoff is slow, and erosion hazard is slight. Effective rooting depth is 60 inches or more. Shrink- swell potential ranges from low in shallow surface soils to moderate below depths of about 6 inches (Lambert and Kashiwagi 1978).

Some of the river adjacent and floodplain areas occurring in younger alluvial materials are susceptible to lateral spreading and liquefaction.

A prominent hardpan is observed throughout the Project Area, often expressed as a bold outcrop along some of the banks and bluffs along the Napa River. This hardpan is comprised of fine to medium-grained Late Pleistocene alluvial fan deposits (including clays, silts, and fine-grained sands). This hardpan is found within areas mapped as part of the "Old Alluvium" (A3GEO 2013, Kunkel and Upson 1960). Though this hardpan shares some lithologic and erosion resistant characteristics with the older Huichica Formation (Early Pleistocene, Late Pliocene), it is not part of the Huichica Formation.

Landslides

Active and dormant landslides are found throughout Napa County dependent on geologic, soil, and hydrologic conditions. Some slides reflect structural mass movement conditions found along slopes with diminished shear strength. In the Project Area, some localized erosion occurs as shearing and slumping features along the streambanks of the Napa River. While these streambank features may cause local erosion they are not considered as a high risk geologic hazard compared to larger hillslope mass movements which are found in the uplands and mountain areas of Napa County (see discussion in County of Napa 2005)

Discussion of Checklist Responses

a. Exposure of People or Structures to Adverse Effects Involving:

1. Rupture of Known Earthquake Fault— *Less Than Significant*

No faults known to be active are located within the Project Area, which is considered very unlikely to experience surface fault rupture. The Proposed Project would not result in construction of structures, nor is it expected to attract additional population into the Project Area (see related discussion in Population and Housing section of this checklist). Consequently, the potential for impacts related to increased exposure of people or structures to surface fault rupture is evaluated as less than significant, and no mitigation is required.

2. Strong Seismic Groundshaking— *Less Than Significant*

The Project Area is located in a seismically active area, and can be expected to experience strong earthquake groundshaking during the lifetime of the Proposed Project. However, as identified in item (a)(1) above, the project would not increase population in the area, and it would not result in the construction of structures. Consequently, the potential for impacts related to increased exposure of people or structures to strong seismic groundshaking is considered less than significant. The project would relocate or regrade some existing flood berms to widen the existing river corridor and improve flood management (i.e. greater channel capacity). The Proposed Project will also enhance and restore stream and riparian habitat conditions through relocating some existing substandard agricultural berms that are located too close to the main river channel. Because the new berms would be constructed to an improved standard, they are expected to perform better in seismic events than the existing berms. Any seismic safety impacts associated with the new berms, if any, would be beneficial compared to the existing condition. No mitigation is required.

3. Seismically Induced Ground Failure— *Less Than Significant*

Because some substrate materials in the Project Area are considered highly susceptible to liquefaction, the new flood and setback berms of the Proposed Project could be at some risk of liquefaction damage in future earthquakes. However, because the new berms would replace aging and often inadequately constructed existing agricultural berms; the new berms are expected to perform better than the existing berms in the event of groundshaking and/or liquefaction. Impacts of constructing the new berms are likely to be generally beneficial from the standpoint of seismic performance. As identified in item (a)(1) above, the project would not increase population in the area, and it would not result in the construction of structures housing people. Consequently, the potential for impacts related to increased exposure of people or structures to seismically induced ground failure, including liquefaction, is evaluated as less than significant overall, and no mitigation is required.

4. Landslides, Including Seismically Induced Landslides— *Less Than Significant*

The Project Area is located on the floor of the Napa Valley and is not subject to considerable landslide risk. The potential for impacts related to existing landslide hazards, including seismically induced landsliding, is less than significant.

As described above, some portions of the streambanks along the Napa River corridor in the Project Area are subject to periodic bank erosion and failure. The Proposed Project includes re-contouring existing streambanks that are erosive, or prone to high erosion, to more stable bank conditions. This is generally achieved through grading existing banks that may be steep into a less-steep and gentler gradient. Lessening the bank steepness is an effective way to reduce the erosion potential at an eroding streambank. This type of geomorphic restoration is considered a beneficial impact of the Proposed Project. Sites that will be re-contoured or graded will have site-specific geotechnical investigations developed at those specific sites to ensure appropriate design and construction.

Impacts related to potential landslides and slope stability are therefore expected to be less than significant overall, and no mitigation is required.

b. Result in Substantial Soil Erosion or Loss of Topsoil — *Less Than Significant*

Construction activities required to develop the Proposed Project – including tree removal, vegetation removal, bank grading and stabilization measures – would have the potential to contribute to increased erosion during the construction period and in the near term period following construction.

However, because the project construction work areas (both in the river channel and out-of-channel) are large enough, a Storm Water Pollution Prevention Plan (SWPPP) and notification for coverage under the National Pollutant Discharge Elimination System (NPDES) General Construction Permit would be required for each phase of construction. This is a requirement of Environmental Commitment measure EC-3GEN and is discussed in the *Hydrology and Water Quality* section of this evaluation. The County would be responsible for ensuring compliance with the requirements of the SWPPP, and would have the authority to stop construction activities in the event of noncompliance or ineffective compliance.

Dewatering activities may be necessary at some Project Sites where in-stream grading/excavation, habitat feature installation and other activities occur. Environmental Commitment measures EC-12GEN and EC-13GEN address dewatering issues and would further reduce the potential for direct erosion into the channel. With the SWPPP and County oversight of other required Environmental Commitments s in place, impacts related to accelerated erosion during construction are expected to be less than significant. Similar measures would also be required for all longer-term Project maintenance activities, so long-term impacts related to erosion and sedimentation are also expected to be less than significant. No mitigation is required.

The Proposed Project's managed streambank retreat areas would entail allowing the channel banks to erode naturally to a pre-determined setback limit which would then be fortified against further bank erosion. Where employed, this natural management approach would allow the existing streambanks to function in their current state, allowing natural erosion and stream processes to occur. Anticipated erosion would not differ from existing conditions in the areas targeted for the managed retreat approach. Over the longer-term, this approach is expected to enable the stream channel width to stabilize and reach an equilibrium channel width. Over time, this would create a beneficial effect, no mitigation is required.

Project earthwork and grading would require temporary removal of topsoil. As much as 403,000 cubic yards of material could be hauled offsite, and as much as 87,000 cubic yards of the topsoil will be reused onsite, either during recompaction and revegetation efforts or for construction of flood protection berms. Soil loss in the short term will be minimized by grass hydroseeding and erosion control fabric. However, as discussed under Environmental Commitment measures EC-2GEN, EC-3GEN, and EC-6GEN in Table 2-11 in Chapter 2, the County will require restoration contractors to sidecast and stockpile removed topsoil so it can be reused during revegetation; site finishing will include topsoil replacement. With this practice in place, impacts related to topsoil loss would be reduced to the extent feasible. Any residual impact is expected to be small and confined, and is considered less than significant. No mitigation is required.

c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse – *Less Than Significant*

As identified in item (a)(4) above, portions of the Project Area are currently subject to bank erosion and failure would be improved by regrading the channel banks to create a wider and gentler bank slope. This type of bank grading is a beneficial impact in terms of restored habitat, stabilized channel banks, and reducing longer-term erosion.

As described above in (b) the proposed managed streambank retreat areas would allow for a wider channel to develop over time. This approach would also be beneficial in reducing unstable and eroding banks over the longer-term.

No other risks related to geologic or soil instability are currently known in the Project Area. However, to ensure site-appropriate design, a geotechnical assessment was conducted for the project (A3GEO 2013, Appendix G). The assessment included an evaluation of the potential for unstable soils in the Project Area and included specific Environmental Commitments to avoid and minimize potential impacts during site preparation, construction, and maintenance. These Environmental Commitments have been incorporated into the Proposed Project and are provided in Table 2-11, and are summarized below.

- EC-26GEO: Berm Configuration (describes set back distances and slope inclination to provide a stable replacement berm).
- EC-27GEO: Site Preparation (describes the many activities that will occur to prepare the site for construction activities).
- EC-28GEO: Fill Materials (describes requirements for the inspection, removal, and potential reuse of fill materials).
- EC-29GEO: Fill Placement (describes the physical parameters such as depth and compaction rates for reusing and placing fill and also describes the testing of the fill material by a qualified geotechnical engineer).
- EC-30GEO: Surface Drainage (describes slope drainage measures to reduce erosion and other impacts).
- EC-31GEO: Maintenance (describes the annual inspection procedure for the constructed berms).

With implementation of these Environmental Commitments, potential impacts related to soil instability are expected to be less than significant, and no mitigation is required.

d. Location on Expansive Soil— *Less Than Significant*

As discussed above, the active Napa River channel and its immediate streambank areas show minimal soil development because the immediate stream corridor is geomorphically active. Floodplain and bench areas adjacent to the active River channel are underlain by soils assigned to the Yolo loam, 0–2% slopes. Shrink-swell potential ranges from low to moderate in the Yolo loam, 0–2% slopes, and is unknown in the active River alluvium but is inferred to be low where alluvium is dominated by sand and gravel, since shrink-swell behavior correlates with the presence of particular clay minerals in the fine sediment fraction. As described above, the Project Area does include several outcrops of a Pleistocene hardpan, located in the mapped "Old Alluvium" and consisting of mostly fine grained materials. Where this hardpan includes expansive clays, then some expansion/contraction may occur. The A3GEO 2013 report (Appendix G) provides more detailed description of this material and its engineering properties. In sum, where exposed along the Napa River channel, this hardpan provides a generally erosion resistant layer. The hardpan is not subject to excessive shrink-swell behavior.

The Proposed Project includes construction of flood and setback berms. Design and construction of the new/relocated berms would be guided by site-specific geotechnical investigations that will include an assessment of foundation conditions, and any corrective measures needed to ensure an acceptable level of berm stability. Onsite materials used in the berms would be subject to engineering testing to verify their suitability for berm construction. As a result, impacts on berm stability as a result of expansive soils are expected to be less than significant, and no mitigation is required.

If moderately expansive soil materials are present in streambank areas, there would be some, probably minor, potential for shrink-swell behavior to result in degradation of bank stabilization treatments over time, as River level fluctuates. However, the annual maintenance program would be expected to identify any damage rising to the level of a performance concern, and any such damage would be corrected through the annual maintenance program. Thus, impacts on the Proposed Project as a result of expansive soils would also be less than significant, and do not require mitigation.

e. Support of Septic Tanks or Alternative Waste Water Disposal Systems — *No Impact*

The Proposed Project is entirely focused on river restoration, and does not include any uses, features, or facilities that would generate wastewater; it does not propose to construct any septic or wastewater disposal systems. Consequently, there would be no impact related to location on unsuitable substrate materials, and no mitigation is required.

3.7 GREENHOUSE GAS EMISSIONS

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the Project:					
a.	Generate a net increase in greenhouse gas emissions in excess of applicable thresholds adopted by the BAAQMD or the CARB which may have a significant impact on the environment?	☐	☐	☒	☐
b.	Conflict with a county-adopted climate action plan or another applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gasses?	☐	☐	☒	☐

Regulatory Setting

This section describes the federal, state, and local regulations related to greenhouse gas (GHG) emissions and climate change. At the federal level, the U.S. EPA has developed regulations to reduce GHG emissions from motor vehicles and has developed permitting requirements for large stationary emitters of GHGs. On April 1, 2010, EPA and the National Highway Traffic Safety Administration established a program to reduce GHG emissions and improve fuel economy standards for new model year 2012-2016 cars and light trucks. On August 9, 2011, EPA and the NHTSA announced standards to reduce GHG emissions and improve fuel efficiency for heavy-duty trucks and buses.

California has recently enacted a number of policies and plans to address GHG emissions and climate change. In 2006, AB 32, the Global Warming Solutions Act was passed, which set the overall goals for reducing California's GHG emissions. The goals are to reduce GHG emissions to 2000 GHG emission levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. CARB is in the process of completing rulemakings to implement GHG emission reduction regulations, with the goal of adopting legally enforceable GHG rules and market mechanisms by January 1, 2012.

The 2008 Napa County General Plan includes policies aimed at reducing local contributions to global climate change. These policies include supporting efforts to reduce GHG emissions, participating in programs related to global climate change, promoting sustainable practices and green technology in development, promoting the research and development of renewable energy technology, and providing incentives for energy-efficient forms of transportation, among others.

The BAAQMD has also developed thresholds of significance for GHG emissions, which were published in the BAAQMD's *California Environmental Quality Act Air Quality Guidelines*

(2010a). **Table 3.7-1** provides the BAAQMD's recommended significance criteria for analysis of GHG impacts, including cumulative impacts.

Table 3.7-1. Applicable BAAQMD CEQA Thresholds of Significance for GHGs

Pollutant	Operational Significance Thresholds
GHGs—projects other than stationary sources	a) Compliance with qualified GHG reduction strategy **OR** b) 1,100 metric tons (MT) of carbon dioxide equivalent (CO_2e) per year **OR** c) 4.6 MT CO_2e/service population (residents and employees) per year

Source: BAAQMD 2010a

Environmental Setting

Anthropogenic emissions of GHGs are widely accepted in the scientific community as contributing to global climate change. Temperature rises associated with climate change are expected to negatively impact plant and animal species, cause ocean acidification and sea level rise, affect water supplies, impact agriculture, and harm public health. California's total GHG emissions were estimated as 448 million metric tons of CO_2 equivalents in 2011 by CARB in its Greenhouse Gas Inventory Data, representing a contribution of 1.4 percent of the world's total GHG emissions in 2012 (CARB 2013; Reuters 2012).

Due to Napa County's rural character, the amount of GHGs emitted is small compared to other counties in the Bay Area and in statewide terms. BAAQMD reports that Napa County's total GHG emissions in 2006 were 1.7 million metric tons of CO_2 equivalents (BAAQMD 2010b), approximately 0.2 percent of the state's total emissions. The largest sources of emissions were from commercial/industrial uses (38.8 percent), followed by on-road vehicles (34.2 percent), residential (18.3 percent), solid waste (6.8 percent), off-road industrial/commercial (1.5 percent), and off-road garden (0.3 percent).

Emissions of GHGs from project construction were estimated using the Road Construction Emissions Model (Model) (Version 7.1.4, developed by the Sacramento Metropolitan Air Quality Management District), which is described in more detail in the methodology section of the Air Quality (Section 3.2). As described for *Air Quality*, a 5-year construction duration was analyzed.

In addition to the combustion of CO_2 from construction, the GHGs CH_4 and N_2O are also emitted during the combustion of fossil fuels from mobile sources. Emissions of CH_4 and N_2O are usually a relatively small proportion of overall transportation-related GHG emissions, about 2 to 5 percent combined (EPA 2008). As such, CO_2 emissions from each phase of the project were augmented by 5 percent to obtain the total emissions from CH_4 and N_2O (given as CO_2e). Emissions are then amortized over the anticipated 50-year life of the restoration project. The results of modeling are presented in **Table 3.7-2**. Detailed emissions calculations information is presented in Appendix C.

Table 3.7-2. Estimated Average Annual Emissions during Project Construction

Emissions Source	Average Annual Emissions (metric tons)			Amortized Emissions (metric tons)
	CO_2	CH_4, N_2O (as CO_2e)	Total (CO_2e)	CO_2e
Construction at All Sites	513.5	25.7	539.1	10.8

Discussion of Checklist Responses

a, b. Generation Of, Or Conflicts With, Plans Or Polices To Reduce Greenhouse Gas Emissions — *Less than Significant*

The project would result in direct emissions of greenhouse gases during construction and maintenance, and would also have an indirect impact on carbon sequestration rates from changes in vegetation cover in riparian areas of the Napa River. The project would not provide a long-term source of GHG emissions.

As shown in Table 3.7-2, direct emissions of GHGs would result in a total of up to 539.1 metric tons of CO_2 equivalents per year during construction. BAAQMD does not have a construction-phase threshold for CO_2 emissions. However, because the project would be constructed over a long duration, it is customary to amortize construction emissions over the operational life of the project as a proxy for operational emissions. As shown in Table 3.7-2, amortized emissions would result in up to 10.8 metric tons of CO_2 equivalent emissions per year, assuming an operational project life of 50 years. This is well below the BAAQMD threshold of 1,100 metric tons per year.

In addition, the project would result in an increase in woody vegetation overall. Though vineyard acreage would be reduced and grapevines removed, native woody vegetation would be planted in its place. The carbon sequestration value of changes in vegetation from project implementation would be increased, resulting in a beneficial effect.

The project would not create a new source of GHG emissions, and would therefore not conflict with any plans or policies adopted to reduce GHG emissions.

Impacts related to generation of GHG emissions would be less than significant. No mitigation is required.

3.8 HAZARDS AND HAZARDOUS MATERIALS

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the Project:					
a.	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b.	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c.	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d.	Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e.	For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the Project Area?	☐	☐	☐	☒
f.	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the Project Area?	☐	☐	☐	☒
g.	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h.	Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☐

Environmental Setting

Contaminated Sites

According to the SWRCB's GeoTracker database, there are 463 sites in Napa County within the San Francisco Bay RWQCB's jurisdiction which have been or have the potential to be contaminated with hazardous waste. Of these, 342 sites have been remediated and are considered closed. The remaining 121 sites are considered open (i.e., still active) and currently being remediated or remain in need of remediation. (State Water Resources Control Board 2013). Most of the sites are located within the valley floor, within incorporated cities located along Highway 29 and particularly the Cities of Napa and St. Helena. There are several hundred wineries and vineyards in Napa County where hazardous substances, such as pesticides, are used. There are no sites within the immediate vicinity of the Proposed Project. Hazardous substances and contaminated sites are regulated under federal and state laws, including the Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the Superfund Amendment and Reauthorization Act (SARA). The majority of these laws are administered and enforced by state agencies such as the California Department of Toxic Substances Control and the State Water Resource Control Board (SWRCB). More information on known contaminated sites is available online at the EnviroStor database maintained by the California Department of Toxic Substances Control: http://www.envirostor.dtsc.ca.gov and the SWRCB's GeoTracker database accessible online at: http://geotracker.swrcb.ca.gov.

Napa Valley has been under active land cultivation for over 100 years, and there may be unknown contamination associated with past agricultural practices (e.g., fuel and pesticide storage and use). However, many vineyards in the Project Area have been certified as organic farms and the soil has been tested to verify that the land is not contaminated by residual chemicals.

Airports

There are two public use airports in the county: the Napa County Airport located south of the City of Napa (approximately 10 miles from the Proposed Project footprint), and the Angwin-Parrett Field located in Angwin east of St. Helena (approximately 9 miles from the Proposed Project footprint).

Wildland Fire Hazards

Napa County has a high wildland fire potential with its long, dry summers, narrow valleys and steep, hilly terrain, and fire-adapted vegetation. In the last several decades, the combination of fire protection technology, environmental regulations, fire suppression policies, and developmental trends have led to increasing fuel loads, and greater potential for catastrophic wild fires. Recognizing the need to assess fire severity, the County closely monitors fire-prone areas with a GIS-based model. The valley floor is ranked as low or moderate fire hazard risk; while the hillslopes on both sides of the valley are ranked as high to very high fire hazard risk.

Mosquito Abatement

Vector control in Napa County is managed by the Napa County Mosquito Abatement District under the Mosquito Abatement Act of 1915. The district manages vectors such as rats, mosquitoes, ticks, and yellow jackets to control the spread of vector-borne diseases including West Nile virus, Lyme disease, malaria, and plague. The district uses a variety of methods to control vectors, including mosquito fish, microbial insecticides, and larvicidal oils. Larval and adult mosquito surveys are conducted to monitor of the spread of vector-borne diseases. Under the California Health and Safety Code, mosquito abatement districts are empowered to take all necessary and proper steps for elimination and extermination of mosquitoes. District personnel make routine inspections of mosquito sources, such as ditches, channels, lagoons, drain lines, marsh areas, creeks, lakes, flood control basins, utility vaults, catch basins and fish ponds. If mosquito production is found, they take action to control or eliminate the problem.

Discussion of Checklist Responses

a, b. Creation Of Hazard Through Transport, Use Or Disposal Of Hazardous Materials — *Less Than Significant*

Construction

Project construction (e.g. channel widening, grading of alcoves, installation of habitat features, etc.) is not expected to create a hazard to the public through the routine use of hazardous materials. Hazardous materials present at the construction sites would include substances such as fuels, oils, and lubricants needed to operate construction equipment. As described in Chapter 2 (see Table 2-11), the selected contractor would be required to implement Environmental Commitment EC-3GEN and implement various erosion control measures to ensure that water quality is protected during construction. Environmental Commitments EC-7GEN, EC-8GEN, EC-10GEN, and EC-11GEN includes provisions for appropriate handling of any hazardous materials used in the Project Area. Environmental Commitment EC-9GEN includes specific provisions that would minimize the potential for, and effects from, spills occurring during project construction and would require the preparation of a Spill Prevention and Response Plan (SPRP). The SPRP will describe transport, storage, and disposal procedures; construction site housekeeping practices; and monitoring and spill response protocols. The County will be responsible for ensuring that the Environmental Commitments for water quality protection, hazardous materials control measures, and the SPRP are appropriately implemented by all contractors.

Control of invasive non-native and Pierce's Disease host plants may require limited application of herbicides. Herbicide application would be limited to cutting and painting stumps, or foliar or spot spray using backpack sprayers. As prescribed in EC-20BIO, herbicide would be applied according to manufacturer's specifications by licensed applicators in a manner that minimizes drip and drift into the stream channel and authorization would be obtained from the RWQCB would be acquired if application would occur below the OHWM.

With these procedures in place, potential impacts related to the transport, use, and disposal of hazardous materials associated with project construction and maintenance are expected to be less than significant, and no mitigation is required.

c. Generation of Hazardous Emissions/ Use of Hazardous Materials Within 0.25 Mile of Schools — *Less Than Significant*

No schools are located within 0.25 mile of the Project Area, so the principal concern relates to haulage of the small quantities of fuels, lubricants, herbicides etc. that may be needed for project construction and maintenance. The nearest school, Yountville Elementary, is in Yountville, more than 1 mile from the Project Area. Because of this school's location away from major arterial routes, it is unlikely that project haul traffic would pass by it. Moreover, transport hazardous materials required during construction or maintenance would comply with all applicable City, County, and other regulations. Because Project activities would comply with all applicable regulations regarding the hazardous waste transport, handling, and use, impacts related to transport of hazardous materials in proximity to schools would be less than significant. No mitigation is required.

d. Location on Listed Toxic Site, and Related Impacts — *Less Than Significant*

No hazardous waste or hazardous substance sites are known to occur within the Project Area. However, the Project Area has a history of agricultural use and may have areas of previously unknown contamination related to the use or storage of agricultural compounds such as pesticides, fertilizers, or fuels. Project construction or maintenance activities thus could encounter unknown contamination. It is noted that many vineyards in the Project Area have been certified as organic farms and the soil has been tested to verify that the land is not contaminated by residual chemicals. However, as described in Chapter 2 (see Environmental Commitment EC-9GEN), in the event that contamination or hazardous materials are encountered during construction, all construction or maintenance activities in the area of the find will stop and the proponent will conduct appropriate hazardous materials investigations to identify and delineate the extent and nature of the contamination. If clean-up or remediation is required, the proponent will ensure that any hazardous waste materials removed during construction are handled, transported, and disposed of according to federal, state, and local requirements. With these procedures in place, impacts related to the discovery of unknown hazardous waste or hazardous substance sites within the Project Area are expected to be less than significant, and no mitigation is required.

e, f. Hazards in the Vicinity of A Public or Private Airstrip — *No Impact*

The Project Area is not located within 2 miles of any public or private airport or airstrip. The closest airport, the Napa Valley Airport, is located approximately 10 miles south of the Project Area. Consequently, the project would not conflict with any airport land use plan or operation of nearby airports, and would not pose any airport-related safety hazard to people working in the Project Area. Therefore, there would be no impact, and no mitigation is required.

g. Interference with Emergency Response or Evacuation Plan — *Less Than Significant*

The project would not interfere with any existing emergency response or evacuation plan. As described in Chapter 2, Environmental Commitments EC-15GEN and EC-16GEN include measures to ensure the contactor maintain adequate traffic flow and coordinating with the appropriate local agency to maintain emergency access prior to initiating construction. This would ensure that any constructed-related impacts on emergency response or evacuation are less than significant. No mitigation is required.

Mosquito Abatement

The Proposed Project would create and increase the extent of areas of intermittent inundation within Napa County. This would create new shallow inundated habitat for aquatic wildlife and riparian vegetation. Areas that are currently inundated on a periodic basis may be modified (i.e. graded to be lower) to be inundated more frequently. Standing water provides potential breeding habitat for mosquitoes and thus increases the potential for transmission of West Nile virus, malaria, dog heartworm, and other diseases. Although this inundation could provide limited standing water habitat for mosquito breeding, the features are would be designed to pass water through to provide a water source for riparian vegetation. As such, these areas would not be inundated for long periods of time and would likely occur during the winter wet season when mosquitos are minimally active. Finally, proposed maintenance activities would not interfere with mosquito abatement efforts conducted by the Napa County Mosquito Abatement District. As such, this impact is considered less than significant. No mitigation is required.

h. Exposure of People or Structures to Risk of Wildland Fires — *Less Than Significant*

The Project Area is located in area region identified as having a low to moderate fire risk hazard. The use of some types of construction equipment, including equipment with internal combustion engine and gasoline-powered hand tools, could pose a risk of wildfire ignition. However, the construction contractor would be required to comply with existing legal requirements under the California Public Resources Code to minimize wildlife risk during construction (see Chapter 2, Environmental Commitments). With these measures in place, impacts related to increased wildfire risks associated with project construction are expected to be less than significant. No mitigation is required.

3.9 HYDROLOGY AND WATER QUALITY

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the Project:					
a.	Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b.	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☒	☐
c.	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on site or off site?	☐	☐	☒	☐
d.	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on-site or off-site?	☐	☐	☒	☐
e.	Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f.	Otherwise substantially degrade water quality?	☐	☐	☒	☐
g.	Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☒	☐
h.	Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	☐	☐	☒	☐

3.9 HYDROLOGY AND WATER QUALITY

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
i.	Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒	☐
j.	Contribute to inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

Setting

Water quality and hydrologic functions are protected by the federal Clean Water Act, California's Porter-Cologne Water Quality Control Act, and the Groundwater Management Act. The County General Plan also contains a number of goals, policies, and action items for water resources protection and management.

Climate and Precipitation

Napa County has a Mediterranean climate with distinct wet and dry seasons. Approximately 90% of the precipitation occurs between November and April and can vary significantly from year to year. In general, precipitation increases from south to north with increasing elevation, and annual precipitation varies by more than a factor of three throughout the County, from 22.5 inches per year (in/yr) in the south County to 75 in/yr in the higher Mayacama Mountains in the northwest County (Napa County, 2005). Annual precipitation in the City of Napa averages approximately 26.5 in/yr. Average annual precipitation in the Town of Yountville, near the Project Area is 34.88 in/yr.

Surface Water Hydrology and Quality

The Napa River is the largest river in Napa County. Its watershed covers approximately 426 square miles, extending in a northwesterly direction approximately 45 miles from San Pablo Bay on the south to Calistoga on the north. The valley is bounded on the west by the Mayacama Mountains (ranging from 1,000 to 2,700 feet above sea level [ft. asl]), on the north by Mt. St. Helena (elevation 4,343 ft. asl), and on the east by a northwest-trending range of mountains that are generally above 2,000 ft. The southern portion of Napa Valley is very flat, with elevations ranging from near sea level on the valley floor to 400 ft. along the valley flanks. The elevation of the Project Area ranges from 79 ft. at its southern end to 127 ft. at its northern end. The higher mountains that ring the Napa River watershed provide the headwater source areas for runoff and sediment that accumulate in the tributary and valley floor streams below. Stream flows in the Napa River and its tributaries generally peak in January and February and are lowest from August through November.

Surface water quality in the Napa River and its tributaries varies seasonally. During the winter months, stormflows convey urban and agricultural runoff and associated pollutants (e.g., fine sediments, fertilizer residue, pesticides, pathogens, metals, and nutrients) into the

River. However, because of high flows and the resulting dilution of pollutant input, pollutant concentrations during this period are relatively low, although turbidity can be elevated by high sediment loading.

During the summer months when streamflow is low, inflows are reduced, but pollutants are more concentrated, water temperatures are higher, and oxygen levels are reduced, resulting in decreased water quality. Because of concerns about degraded water quality, the Napa River was placed on the 303(d) list of "impaired" water bodies that do not meet water quality standards for sediment and pathogens by the San Francisco Bay RWQCB. As a result of this listing and concerns about adverse impacts to aquatic habitat and associated species, the RWQCB has developed Total Maximum Daily Load (TMDL) programs that established pollutant budgets and control plans in the Napa River. Additionally, the RWQCB is developing a TMDL to address elevated nutrient concentrations. The Napa River Sediment TMDL identified streambank erosion as a primary source of fine sediments in the Napa River and recommends implementation of projects to stabilize actively eroding streambanks, control channel incision, and restore aquatic habitat (San Francisco Bay Regional Water Quality Control Board 2005). The Proposed Project addresses several of the goals of the TMDL through providing a more stable stream channel with wider banks in several locations that is less erosive and over the longer-term will contribute fewer eroding bank sediments to the river downstream.

Groundwater Hydrology and Quality

The major aquifers in the County are the North Napa Valley and Milliken-Sarco-Tulucay groundwater basins. Smaller aquifers include the Carneros groundwater basin and small basins within the Putah Creek Watershed (Napa County 2005). The North Napa Valley groundwater basin is the largest and most productive groundwater basin in the County and is found beneath the Project Area. This basin extends from just north of the City of Napa up the valley floor to the northwestern end of the valley just north of the City of Calistoga, covering an area of approximately 60 square miles. In general, groundwater flow in the North Napa Valley groundwater basin is from the valley edges inward toward the center, and southwest towards San Pablo Bay. Studies conducted by the District estimate the storage capacity of these surficial deposits at approximately 190,000 acre-feet, and the average annual recharge for the basin from deep percolation, surface tributary flow, and subsurface flow at approximately 26,800 acre-feet per year. Within the Project Area, groundwater is pumped for both domestic and agricultural use (Napa County 2005).

In general, the depth to groundwater in the Napa Valley ranges from about 20 to 50 feet below ground surface during the spring. Boring investigations in 2013 indicated that groundwater was found generally between 20-25 ft. below the ground surface in the Project Area (A3GEO 2013). Long-term trends have been generally stable with the exception of the northeastern area of the County where there has been a 10 to 30 foot decline over the past 10 years. Seasonal groundwater elevations may fluctuate up to 10 to 40 feet in depth in the Napa Valley region (Luhdorff & Scalmanini 2011).

Groundwater quality in the basin is primarily affected by pollutants (e.g., pesticide and/or fertilizer residues) that are leached out of surface soils by rainfall and conveyed into the aquifer through percolation. Surface water contaminants also have the potential to impact groundwater quality (Napa County 2005).

Discussion of Checklist Responses

a, c, f. Violation of Water Quality Standards or Waste Discharge Requirements, Erosion and Siltation Impacts Related to Alteration in Existing Drainage Patterns, Other Degradation of Water Quality — *Less Than Significant*

Construction

Ground-disturbing construction activities that would occur in-channel such as grading, excavation, and stockpiling of spoil materials, could cause soil erosion and sedimentation, and reduce water quality in the Napa River. These activities would include channel widening, lowering of stream banks, installation of biotechnical stabilization features, installation of habitat features, etc. Additionally, hazardous materials (e.g., gasoline, oils, grease, lubricants) from construction equipment could be accidently released during construction. Accidental discharge of these materials to adjacent surface waters could adversely impact water quality, endanger aquatic life, and/or result in a violation of water quality standards.

Potential impacts on water quality during project construction would be addressed by the construction Environmental Commitments incorporated into the project (see EC-1GEN through EC-13GEN in Chapter 2, Table 2-11) which include provisions to avoid and/or minimize work in the active/wetted stream channel, control erosion and sedimentation, as well as a Spill Prevention and Response Plan to avoid, and if necessary, clean up accidental releases of hazardous materials. As the project proponent, the County would be responsible for ensuring compliance with all conditions of these commitments.

Out-of-channel construction activities such as vegetation removal, grading of areas for setback alcoves, restoration of floodplains, new protective berms and relocated agricultural access roads, could result in some erosion and increase sedimentation through runoff into adjacent surface waterways. Additionally, areas where existing vineyard may be removed to be restored to riparian habitat (including managed retreat activities) may also require ground disturbance, contributing to the aforementioned erosion potential. However, the Environmental Commitments mentioned previously, which include utilizing existing access, staging in previously disturbed areas, and erosion control measures, would avoid and minimize the potential impacts to water quality.

For both in-channel and out-of-channel areas, during the period following construction, before vegetation is fully established, there is some potential for erosion at Project Sites (e.g., inset flood floodplain benches and slopes, earthen berms, biotechnical stabilization features) and potential increases in sediment loading to the Napa River. However, all project features would be seeded (hydroseeded), and various erosion control features installed in erosion-prone areas, to prevent erosion and sedimentation. Additionally, as part of the project maintenance plan, all constructed features would be monitored annually, and any necessary remedial actions (e.g., additional planting and/or erosion blanket and other control installation) will be implemented by the County.

With these commitments, and County oversight, adverse construction-related effects on water quality would be avoided and minimized to the extent feasible, and no violation of

water quality standards or waste discharge requirements is anticipated. Impacts are considered less than significant, and no mitigation is required.

Long Term Maintenance

The project would result in restoring and enhancing geomorphic processes in the Napa River corridor. The treatments of the Proposed Project were designed to improve the channel's ability to convey floodflows, reduce undesirable bank erosion and sediment loading effects. These actions are consistent with, and support the sediment TMDL for the Napa River and are regarded as long-term benefits to the system. No mitigation is required.

As described above in Surface Water Hydrology and Quality, the Napa River was placed on the Clean Water Act Section 303(d) list of "impaired" water bodies that do not meet water quality standards set by the San Francisco Bay RWQCB, and TMDL programs have been developed to address sediment in the Napa River system. The long-term geomorphic changes resulting from the project (e.g., creation of inset floodplain benches/slopes, bank stabilization, and aquatic habitat enhancement structures) would stabilize actively eroding streambanks, reduce local flow velocities, and reduce inputs of fine sediments to the channel; control channel incision; and enhance habitat for native aquatic species. All of these outcomes are consistent with recommendations in the sediment TMDL and would represent benefits to water quality. No mitigation is required.

Project maintenance activities such as minor grading, bank toe stabilization, invasive non-native vegetation control, targeted woody vegetation removal, and Pierce's disease host plant removal could cause local soil erosion and sedimentation, and reduce water quality locally in the Napa River. Additionally, hazardous materials (e.g., gasoline, oils, grease, lubricants, herbicides) used during maintenance could be accidently released during construction. Accidental discharge of these materials to adjacent surface waters could adversely impact water quality, endanger aquatic life, and/or result in a violation of water quality standards. However, maintenance workers would be required to follow the same water quality Environmental Commitments as mentioned above during project construction. The County will be responsible for ensuring that the measures provided in the project maintenance program are appropriately implemented by all maintenance workers. With these commitments, and County oversight, maintenance-related impacts to water quality and water quality standard are expected to be less than significant, and no mitigation is required.

b. Effects on Groundwater Supply or Recharge — *Less Than Significant*

Proposed Project features (e.g., channel widening, grading back of stream banks, installation of biotechnical stabilization features, installation of habitat features, etc.) have been sited to avoid impacts to existing groundwater wells and pumping facilities, and no new wells or pumps would be installed as part of the project. Some limited areas of compacted earthen berms may be relocated or installed where floodplain benches and slopes are installed, but the overall increase would be minimal, consisting mainly of relocated berms. However, the berm surface would be loosely compacted, allowing some infiltration, and any storm runoff that would collect behind the berms on the adjacent floodplain would still be able to infiltrate into the ground. Thus, the slight increase in impervious area associated with any new earthen berms would have very little effect on groundwater recharge or on

groundwater supply. Impacts are therefore expected to be less than significant, and no mitigation is required.

Proposed native plantings would require supplemental irrigation or hand watering for approximately 3–5 years following installation. Irrigation may rely on existing sources of groundwater. However, the total planting area is relatively small and irrigation would be limited to drip irrigation and handwatering of specific areas. Thus, irrigation of native plantings would require comparatively small quantities of water compared to adjacent agricultural areas and would have very little effect on groundwater reserves/supply within the Project Area. Impacts are therefore expected to be less than significant, and no mitigation is required.

d, e, g, h, i. Runoff and Flooding Impacts Related to Alteration in Existing Drainage Patterns, Effects on Capacity of Existing or Planned Stormwater Drainage Systems, Potential to Increase Flooding Hazards — *Less Than Significant*

Stormwater Systems

The project would not result in any changes affecting the capacity of existing or planned stormwater drainage systems. Through the Project Area there are local drainage channels and culverts that drain adjacent areas to the Napa River. The Proposed Project features have been sited to avoid impacts to existing drainage culverts and channels, and the relocated earthen berms (if necessary) would be constructed with gaps to allow existing channels to drain into the river (if that situation is needed). No new stormwater culverts would be installed as part of the project. Therefore, impacts on stormwater drainage systems are expected to be less than significant, and no mitigation is required.

Increased Flood Hazards

As identified above, the project is specifically designed to modify selected portions of the Napa River channel and some immediately adjacent floodplain areas. The purpose of these modifications is to restore more natural geomorphic processes and improve channel and floodplain function. Project features will be constructed within the 100- and 500-year flood hazard zones identified by FEMA. The Napa County Floodplain Management Ordinance requires any project proposed for construction within the floodplain of a stream or river to obtain a floodplain permit and to demonstrate that the project will not result in an increase in the 100-year base flood elevation. Preservation of existing flood protection will be documented in a formal Conditional Letter of Map Revision to be filed with FEMA and a Letter of Map Revision subsequent to project implementation. Maintenance of relocated or new set-back berms will be the responsibility of private landowners and/or Napa County under the Oakville Oak Knoll Stream Maintenance District. The widening of the river channel in locations in the Project Area along with some restoration of floodplain function would provide beneficial effects of increased channel capacity and floodplain storage. These outcomes are anticipated to reduce the overall flood risk in the Project Area and reduce potential for damage to adjacent agriculture and residences. Therefore, impacts related to flood hazards are expected to be less than significant, and no mitigation is required.

j. Potential to Contribute to Seiche, Tsunami, and Mudflow Hazards — *No Impact*

The Project Area is located inland, approximately 20 miles from the nearest large water body (San Pablo Bay). Consequently, there is no risk of seiche or tsunami and there would be no impact related to increase of any such risk as a result of the project. The Project Area is located on the valley floor approximately 0.5 mile away from the nearest hillslope area, so is unlikely to be affected by, or to increase the potential for, mudflows. Therefore, no impact related to increase of mudflow risks is anticipated. No mitigation is required.

3.10 LAND USE AND PLANNING

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the Project:					
a.	Physically divide an established community?	☐	☐	☐	☒
b.	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c.	Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

Setting

Land use planning in unincorporated areas of Napa County is governed by the Napa County General Plan (Napa County 2008). The General Plan envisions agriculture as the "primary land use" in the County "well into the future" (Napa County 2008 p. AG/LU-11), and includes a number of goals specific to agricultural preservation and related land issues. It also includes many goals that indirectly guide and constrain land use planning through protections for the County's aesthetic values, agricultural uses, riparian and wetland areas, and sensitive plant and wildlife species; and through flood protection and other safety-oriented policies. In the Conservation Element, Policy CON-6 requires the County to "impose conditions on discretionary projects which limit development in ecologically sensitive areas such as those adjacent to rivers or streamside areas." A number of General Plan goals and policies also specifically address the need to protect and preserve riparian and instream habitat values, to support the County's fisheries, and particularly native anadromous fish species (Chinook salmon and steelhead).

The Proposed Project would be entirely located on privately owned land. Affected parcels and parcel numbers are listed in Table 2-1 in Chapter 2. The Project Area is entirely within the unincorporated portion of Napa County and, like much of the unincorporated County, is rural and agricultural in character. The County General Plan (Napa County 2008) designates the Project Area, and surrounding lands along the Napa River, as Agricultural Resource (AR) lands (Figure AG/LU-3), and they are zoned AP (Agricultural Preserve). Lands immediately along the Napa River are also subject to the General Plan policy (Policy CON-6) requiring the County to impose conditions that limit development in ecologically sensitive areas "such as those adjacent to rivers or streamside areas."

Discussion of Checklist Responses

a. Divide an Established Community — *No Impact*

The Proposed Project would take place in a rural, agricultural area. Earthwork to restore a more functional channel geometry, bank stabilization, and other project features would be located along the immediate Napa River corridor, and would not materially alter the way the river functions in its societal context. Consequently, there would be no impact related to physical division of an established community, and no mitigation is necessary.

b. Conflicts with Land Use Plans or Policies — *No Impact*

Land use planning in the Project Area is guided by the Napa County General Plan (Napa County 2008). Goal CON-1 in the General Plan Conservation Element stresses resource conservation based on determining appropriate land uses and minimizing conflict with the natural environment and "the agriculture it supports." Under Goal CON-1, Policy CON-1 further stipulates that the County "will preserve land for greenbelts, … flood control, … habitat for fish, wildlife and wildlife movement, native vegetation, and natural beauty," and will "encourage management of these areas in ways that promote wildlife habitat renewal, diversification, and protection." The Proposed Project, which is intended to support long-term sustainable restoration of Napa River stream function, geomorphology, and riparian and aquatic habitat value, is explicitly consistent with this fundamental General Plan goal and policy.

Through its emphasis on improving riparian habitat, the Proposed Project addresses the following additional goals from the Conservation Element.

Goal CON-2: Maintain and enhance the existing level of biodiversity.

Goal CON-3: Protect the continued presence of special-status species, including special-status plants, special-status wildlife, and their habitats, and comply with all applicable state, federal, or local laws or regulations.

Goal CON-4: Conserve, protect, and improve plant, wildlife, and fishery habitats for all native species in Napa County.

Goal CON-5: Protect connectivity and continuous habitat areas for wildlife movement.

Several policies in the Conservation Element are specific about the importance of the Napa River and the County's fisheries resources, stressing stream health, fisheries resources, and the need for environmentally sensitive flood protection:

Policy CON-10: The County shall conserve and improve fisheries and wildlife habitat in cooperation with governmental agencies, private associations and individuals in Napa County.

Policy CON-11: The County shall maintain and improve fisheries habitat through a variety of appropriate measures, including the following as well as best management practices developed over time:

(d) Encourage and support programs and efforts related to fishery habitat restoration and improvement including steelhead presence

surveys, development and utilization of hydraulic modeling, and removal of fish barriers.

(e) Manage the removal of invasive vegetation and the retention of other riparian vegetation to reduce the potential for increased water temperatures and siltation and to improve fishery habitat.

Policy CON-46: Napa County's past, present, and future are intertwined with that of the Napa River; therefore, the County is committed to improving and sustaining the health of the river, through attaining water quality and habitat enhancement goals … and completing federal, state, and local flood control projects that are consistent with 'living rivers' principles.

Policy CON-50: The County will take appropriate steps to protect surface water quality and quantity, including the following:

(b) Encourage flood control reduction projects to give full consideration to scenic, fish, wildlife, and other environmental benefits when computing costs of alternative methods of flood control.

The Project would improve diversity, complexity, and overall quality of instream habitat and thus would benefit fisheries resources, consistent with Policies CON-10, CON-11, and CON-46. Its emphasis on reducing catastrophic flood hazard by restoring natural channel and floodplain function and habitat value speaks to Policy CON-50 as well.

The Project Area and its surrounds are designated as Agricultural Resource lands in the current County General Plan (Napa County 2008). Although it would require the permanent conversion of a comparatively small amount (36 acres) of land currently in vineyards, because the Project is expected to reduce risks of catastrophic flooding in adjacent vineyard lands, it would not be in conflict with the AR zoning or with adjacent agricultural uses. The Project's approach is also consistent with Goal SAF-1 and Policy SAF-24 in the General Plan Safety Element, which recognize the flood conveyance capability of agricultural lands:

Goal SAF-1: Safety considerations will be part of the County's education, outreach, planning, and operations in order to reduce loss of life, injuries, damage to property, and economic and social dislocation resulting from fire, flood, geologic, and other hazards.

Policy SAF-24: The County recognizes that agricultural open space also serves a valuable purpose in promoting safety, and that maintaining areas subject to flooding in agricultural or open space uses minimizes the impacts of flooding on homes and businesses.

The Project would be exempt from the County Conservation Regulations' setback requirements because it (1) would not result in the construction of structures, and (2) would be required to obtain state and federal permits through processes protective of natural resource values.

The Proposed Project, which emphasizes restoring and improving habitat value, while reducing flood risks through improved stream function is thus consistent in spirit and in detail with numerous General Plan Goals and Policies and with applicable County land use

and planning codes. There would be no impact related to conflicts with land use plans, policies, or regulations, and no mitigation is required.

c. Conflicts with Habitat Conservation Plans — *No Impact*

The Project Area is not covered by any HCP or NCCP. Thus, there would be no impact related to conflict with an adopted or proposed conservation plan, and no mitigation is required.

3.11 MINERAL RESOURCES

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the Project:					
a.	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b.	Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒

Setting

According to the Napa County General Plan, state mineral resource zone maps do not exist for the majority of the County. However, the State Department of Conservation, Office of Mine Reclamation currently recognizes 3 active mines in the County: the Napa Quarry, the Pope Creek Quarry, and the American Canyon Quarry. Of these, the Napa Quarry is the only significantly producing mine which generates approximately 500,000 tons of basalt rock annually for use as concrete aggregate. (Napa County 2008)

Discussion of Checklist Responses

a, b. Loss of Availability of Mineral Resources — *No Impact*

None of the mines described above are located within the boundaries of the Napa River where restoration activities would take place. Furthermore, the Project would not involve any activities that could directly affect the long-term production of any mineral production sites.

During construction, the gravel augmentation component of the Project would require up to 5,000 cubic yards of gravel. Gravel would be sourced from adjacent tributaries or from nearby quarries. In either case, this one-time requirement of gravel material would not represent an appreciable fraction of the total aggregate resources used annually in the County. Consequently, there would be no impact with respect to mineral resources of local, regional, or statewide importance. No mitigation is required.

3.12 NOISE

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the Project result in:					
a.	Exposure of persons to or generation of noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies?	☐	☐	☒	☐
b.	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c.	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d.	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e.	For a project located within an airport land use plan area, or, where such a plan has not been adopted, within 2 miles of a public airport or public-use airport, would the project expose people residing or working in the Project Area to excessive noise levels?	☐	☐	☐	☒
f.	For a project within the vicinity of a private airstrip, would the project expose people residing or working in the Project Area to excessive noise levels?	☐	☐	☐	☒

Noise Concepts and Terminology

Noise can be defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level is the most common descriptor used to characterize the loudness of an ambient sound level, or sound intensity. The decibel (dB) scale is used to quantify sound intensity. Because sound pressure can vary enormously within the range of human hearing, a logarithmic scale is used to keep sound intensity numbers at a convenient and manageable level. The human ear is not equally sensitive to all frequencies in the entire spectrum, so noise measurements are weighted more heavily for frequencies to which humans are sensitive in a process called "A-weighting," written "dBA."

Different types of measurements are used to characterize the time-varying nature of sound. Below are brief definitions of these measurements and other terminology used in this chapter.

- **Sound** is a vibratory disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, can be detected by a receiving mechanism, such as the human ear or a microphone.
- **Noise** is sound that is loud, unpleasant, unexpected, or otherwise undesirable.
- **Decibel (dB)** is a unitless measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micro-pascals.
- **A-weighted decibel (dBA)** is an overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
- **Maximum sound level (L_{max})** is the maximum sound level measured during the measurement period.
- **Minimum sound level (L_{min})** is the minimum sound level measured during the measurement period.
- **Equivalent sound level (L_{eq})** is the equivalent steady-state sound level that, in a stated period of time, would contain the same acoustical energy as a time-varying sound level during that same period of time.
- **Percentile-exceeded sound level (L_{xx})** is the sound level exceeded *x* percent of a specific time period. L_{10} is the sound level exceeded 10 percent of the time.
- **Day-night level (L_{dn})** is the energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels during the period from 10:00 p.m. to 7:00 a.m.

In general, human sound perception is such that a change in sound level of 3 dB is just noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving the sound level. **Table 3.12-1** presents example noise levels for common noise sources, the levels are measured adjacent to the source.

Table 3.12-1. Examples of Common Noise Levels

Source	Noise Level (dBA)
Weakest sound heard by average ear	0
Whisper	30
Normal conversation	60
Ringing telephone	80
Power lawnmower	90
Tractor	96
Hand drill	98
Bulldozer	105
Chain saw	110
Ambulance siren	120
Jet engine at takeoff	140

Source: National Institute of Safety and Health 2008

The term *noise sensitive land uses*, also referred to in this section as *sensitive receptors* include residences, schools, hospitals, or other similar locations where excess noise would negatively affect normal functions.

Regulatory Setting

Acceptable noise levels in unincorporated areas of Napa County are established in Title 8 of the County Code of Ordinances. The standards as applicable to construction activities are described below in **Table 3.12-2**. The County Noise Ordinance further prohibits the use of equipment used in construction, drilling, repair, alteration, or demolition work between the hours of 7:00 a.m. and 7:00 p.m. to prevent construction-related noise from disturbing residential or commercial property owners.

Table 3.12-2. Napa County Noise Limits for Construction Activities

Time Period	Residential	Commercial**	Industrial
Day (7 am- 7pm)	75 dBA	80 dBA	85 dBA
Night (7 pm-7 am)*	60 dBA	65 dBA	70 dBA

* Construction generally not permitted at night
**A winery (i.e., tasting room, point of sale) is considered a commercial use

Table 3.12-3 details typical construction equipment noise levels as measured 50 feet from the source, according to the Federal Highway Administration. Equipment that would be used for project construction activities is listed.

Table 3.12-3. Construction Equipment Noise Emission Levels

Equipment	Typical Noise Level 50 feet from Source (dBA)
Tractor	84
Aerial boom lift	75
Excavator	81
Dozer	82
Chain saw	84
Plate compactor	83
Haul truck	76

Source: Federal Highway Administration 2006 (http://www.fhwa.dot.gov/environment/noise/construction_noise/rcnm/rcnm.pdf)

Environmental Setting

Noise conditions in the Project Area vary greatly based on local land uses. The Napa BDR identifies major noise sources in the County, which includes roadway traffic, aircraft, agricultural activity, and the Napa Valley Wine Train. A brief summary of the existing noise conditions as detailed in the Napa BDR is provided below.

Roadways that have traffic volumes in excess of 3,000 vehicles per day are major sources of traffic noise in the County. Such roadways include Interstate 80, State Routes 12, 29, 121

and 128, the Silverado Trail, and other County collector and arterial roads. Existing noise levels at 100 feet from such roadways range from a high of 79 L_{dn} (along Interstate 80) to a low of 54 L_{dn} (along College Avenue in the unincorporated Angwin area).

There are several airports and local landing strips in the County, though the Napa County Airport is the main source of aircraft operations in the Project Area. Activity at private airstrips is highly variable. Some airstrips are primarily used for crop-dusting and use is dependent on seasonal farming needs.

Tractors, harvesters, and crop-dusting aircraft are the primary agricultural noise sources in the County. Typical noise levels from tractors, measured at a distance of 50 feet, average approximately 84 dBA. Other noise sources in agricultural areas include winery operation activities, such as refrigeration equipment, barrel washing, bottling, and delivery vehicles.

The Napa Valley Wine Train operates on a 36-mile rail line that runs twice daily from the City of Napa to the City of St. Helena. On weekends, the train offers lunch trips from the City of Napa to the community of Rutherford. The train generates noise levels of approximately 85 to 90 dBA.

Discussion of Checklist Responses

a. Exposure to Noise Levels in Excess of Local or County Standards — *Less than Significant*

As described in Chapter 2 (*Project Description*), construction is expected to be phased over a period of 5 years, and no more than 2 of the project restoration sites would be under construction at any one time. Construction of each project phase is expected to occur over a maximum 6- to 7-month timeframe, and work would be limited to weekdays. Additionally, project features (e.g., earthen berms, inset floodplain benches/slopes) are dispersed throughout the 4.5-mile Project Area and, for the most part, are not concentrated in one single location. However, noise from operation of construction equipment could affect sensitive receptors (e.g., residences, wineries) in the project vicinity.

Construction noise sources would include a variety of heavy equipment and other machinery. An inventory of construction equipment and associated noise levels are presented in **Table 3.12-4**. The location of sensitive receptors was mapped (Google Earth 2012) and various sensitive receptor distances from construction work was modeled using the Federal Highway Administration's Roadway Construction Noise Model (2006). Table 3.12-4 presents modeled noise generation levels for the three noisiest pieces of construction equipment. A reasonable worst-case assumption is that the three loudest pieces of equipment for each phase would operate simultaneously for a combined-source noise level.

Table 3.12-4. Construction Noise Generation at Various Distances

Distance between Receptor and Equipment (feet)	Lmax (dBA)	Receptor	Restoration Site
50	85.0	n/a	n/a
80	80.9	Residence and/or winery present	Sites Site 19, Site 14, Site 13, Site 16
200	73.0	Residence and/or winery present	Site Site 19
300	69.4	Residence and/or winery present	Sites 4, Site 18, Site 17, Site 16
400	66.9	Residence and/or winery present	Sites 9, 7
500	65.0	Residence and/or winery present	Sites 21, 22
600	63.4	Residence and/or winery present	Sites 7, 9
700	62.1	Residence and/or winery present	Sites 3, 4, 7, 9, Site 19
800	60.9	Residence and/or winery present	Sites 3, 23
900	59.9	Residence and/or winery present	Sites 3, 4
1,000	59.0	Residence and/or winery present	Sites 18, 23

Notes: Dark gray shading indicates exceedance of commercial daytime noise limit; light gray shading indicates exceedance of residential daytime noise limit

Source: Horizon Water and Environment 2013, Google Earth 2013

As shown in Table 3.12-4, residential daytime noise limits would be exceeded during periods of intense construction at Sites 4, 7, 9, 16, 17, 18, and 19; commercial daytime noise limits would be exceeded during periods of intense construction at Sites 16, 17, 18, and 19.

Truck traffic to and from the construction sites could also have the potential to create additional noise for residences and commercial establishments located along haul routes. Thus, there is some potential for levels at the nearest noise-sensitive locations to exceed the County noise ordinance noise. However, the modeled construction noise levels shown in Table 3.12-4 reflect a conservative condition where the loudest pieces of equipment are assumed to operate continuously for a 1-hour period. In reality, construction activities would be intermittent and short term. Additionally, construction noise levels are well within the range of existing noise levels in the Project Area associated with typical farming activities (average of approximately 84 dBA) and winery operations (range of between 52 and 87 dBA).

Nonetheless, there is still some potential for significant short-term construction-related noise impacts where construction occurs in close proximity to local residences and commercial establishments. To reduce impacts on sensitive land uses as much as possible, the lead agency will implement Environmental Commitment measure EC-17GEN, which will ensure notification of residences and noise attenuation measures to reduce noise to the extent feasible (see Chapter 2, Table 2-11). With these measures in effect, impacts would be reduced to the extent feasible, and are expected to be less than significant. No mitigation is required.

Project maintenance activities may require the use of heavy equipment, or gasoline-powered hand tools that would result in increases in noise. However, these increases would be temporary, short-lived, and highly localized, and would implement the same noise

abatement measures required during construction. Therefore, impacts are expected to be less than significant, and no mitigation is required.

b. Exposure to Excessive Groundborne Vibration or Noise — *No Impact*

Construction activity associated with the operation of heavy equipment may generate localized groundborne vibration and noise. However, vibration from ground-disturbing construction activity is typically below the threshold of perception when the activity is more than 50 feet from the receiver. The closest sensitive receptors to any of the construction sites is 80 feet away; therefore, impacts from groundborne vibration or noise are not expected to be perceptible off site. No impact would occur.

c. Permanent Substantial Increase in Ambient Noise Levels — *Less than Significant*

Following project construction, maintenance activities would result intermittent increases in noise. However, these increases would be temporary, short-lived, and would occur intermittently throughout the 4-mile project reach. In addition, as identified above, maintenance activities would incorporate the same noise abatement measures required during construction. In light of these factors, impacts are expected to be less than significant, and no mitigation is required.

d. Substantial Temporary Increases in Ambient Noise Levels — *Less than Significant*

Construction and maintenance activities would result in temporary increases in noise. However, as discussed in the response to item (a) above, construction activities would not occur during the evening hours or holidays, and the District would implement Environmental Commitment measure EC-17GEN to reduce effects on sensitive receptors within the Project Area. Consequently, this impact would be less than significant, and no additional mitigation is required.

f-g. Exposure to Excessive Noise Levels in an Airstrip or Airport Land Use Area — *No Impact*

The Proposed Project is not located within an airport land use plan area or within 2 miles of any public airport or private airport or airstrip. Therefore, there would be no impact related to airport noise exposure, and no mitigation is required.

3.13 POPULATION AND HOUSING

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the Project:					
a.	Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b.	Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c.	Displace a substantial number of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Setting

As shown in Figure 2-1, the proposed restoration activities would occur along 9 miles of the Napa River between the Oakville Cross Road Bridge and the Oak Knoll Avenue Bridge in Napa County. As of 2010, the most recent U.S. Census, the population in Napa County (including all cities and towns) was approximately 136,484 (U.S. Census Bureau 2010). While there may be existing housing units in the vicinity of the river corridor, none are located within the project boundaries.

Discussion of Checklist Responses

a. Induce Population Growth — *No Impact*

The project is not expected to induce population growth in the Project Area, either directly or indirectly: it focuses entirely on river restoration, does not include a residential component, and would not alter existing residential zoning or development policies. Although the project would employ a small number of persons for the relatively short duration of construction, it would not offer sufficient short-term employment opportunities to attract a temporary worker population into the Napa County area, nor would it create long-term employment opportunities as no additional County staff would be required to carry out the proposed on-going maintenance activities of the project. Consequently, the project is not expected to have any impact relative to population growth, and no mitigation is required.

b, c. Displace Population or Housing — *No Impact*

As described above, the Project would not involve the construction or development of additional infrastructure. Furthermore, no housing units exist within the project limits where construction or maintenance would occur. Consequently, no housing units or population would be displaced, and there would be no need for housing construction as a result of the project. No mitigation is required.

3.14 PUBLIC SERVICES

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the Project:				
a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

Setting

Fire Protection

The County of Napa contracts with the California Department of Forestry (CAL FIRE) for fire protection services as the Napa County Fire Department. CAL FIRE provides administrative support and coordination with six full-time paid stations and nine volunteer fire companies operating under a County Fire Plan, which is approved by the County Board of Supervisors. The Napa County Fire Chief is responsible for the direction and coordination of fire protection services by these organizations on a Countywide basis. The County contracts with the cities of St. Helena and Calistoga, and Schell-Vista Fire Protection District for the provision of fire protection services to specified unincorporated areas adjoining these agencies. The Napa County Fire Department provides fire and emergency service dispatching for the City of St. Helena, Calistoga and Napa State Hospital Fire Departments. The Town of Yountville and the California Veterans Home contracts with the County to provide fire services to those jurisdictions (Napa County 2013).

Police Protection

The primary responsibility for law enforcement and police services in the County rests with the Napa County Sheriff's Department (NCSD), which operates five stations, located in Napa, Yountville, St. Helena, Angwin, and Lake Berryessa. NCSD also has mutual aid agreements

with several other law enforcement agencies, including the St. Helena Police Department, City of Calistoga Police Department, City of Napa Police Department, Vallejo Police Department, and California Highway Patrol (Napa County 2005).

In 2011, the Sheriff's Department received 46,357 calls for service (Napa County 2011). The average response time for all types of calls is 17 minutes. First-priority emergency/in-progress calls generally receive service within 5 minutes. Second and third priority calls have response times of 10–15 minutes, and lower priority calls may have response times up to 30–40 minutes (Napa County 2005).

Schools

There are five main school districts in Napa County: Napa Valley Unified School District, St. Helena Unified School District, Calistoga Joint Unified School District, Howell Mountain Elementary School District, and Pope Valley Union Elementary School District. As of the 2011-2012 school year, these districts altogether operate 45 schools and serve 20,407 students. The Napa County Office of Education operates four court and community schools for 177 students (NCES 2012). Residents of southeastern unincorporated Napa County are within the boundaries of the Suisun Valley Elementary District and the Rodriguez High School District, two schools that are part of Yolo County's Fairfiled-Suisan Unified School District. School facilities are currently considered adequate to meet the existing demand (Napa County 2005).

Parks

As discussed in more detail in the following section of this checklist, recreation is an important contributor to the County's quality of life, and the County boasts numerous federal, state, local, and private parks and recreational facilities. **Table 3.14-1** lists federal, state, and county facilities.

Table 3.14-1. Federal, State, and County-Operated Parks and Recreational Facilities in Napa County

Facility Type	Name of Facility
Federal (Bureau of Reclamation)	Lake Berryessa Knoxville Off-Highway Vehicle (OHV) and Recreational Area
State	Bothe–Napa Valley State Park Robert Lewis Stevenson State Park Bale Grist Mill State Historic Park
County	Berryessa Vista Wilderness Park Cuttings Wharf Boat Launch (Napa River) Napa River Ecological Reserve Skyline Wilderness Park Solano Avenue Bike Rest Stop

Source: Napa County 2005

Napa County also offers access to regional trail networks, including the Blue Ridge/Berryessa Natural Area trail system, and portions of the Bay Area Ridge Trail and San Francisco Bay Trail (Napa County 2005).

Discussion of Checklist Responses

a. Provision of Public Services — *No Impact*

The Proposed Project would not increase population in the Project Area (see related discussion in the *Population and Housing* section of this checklist), nor would it alter the distribution of population in the Project Area, either temporarily or permanently. Thus, it would not increase the demand for fire protection, police services, schools, or parks over either the short or long term.

The Proposed Project focuses on restoring and enhancing river function and habitat value along the Napa River; it would not construct buildings or other structures and thus would not add to the existing urban fire protection need or responsibilities in the County. Since the Project Area is already a quasi-natural riparian corridor, the Project would not materially alter the need for wildland fire protection.

There would be no impact related to any need to provide additional public services, and no mitigation is required.

3.15 RECREATION

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the Project:					
a.	Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b.	Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☐	☒

Setting

Though widely known for sightseeing and agriculturally-based leisure activities (e.g., wine touring and tasting), Napa County also provides public recreation in the form of parks and trails. Parks in the County can be characterized as either regional or community parks. Community parks are generally small in size and located in urban settings. These types of parks are generally maintained by local jurisdictions and are focused on community activities and local sporting events (e.g., soccer games). Regional parks may be owned by federal, state, or county agencies and serve both local residents as well as visitors from other communities. Regional parks contain significant natural features (e.g., open space, lakes) and are primarily focused on providing nature-based recreation activities. The most popular recreational activities in the County by residents are walking for fitness and fun, walking pets, sightseeing, and wildlife viewing (Napa County 2008). There are no public parks or recreational areas within the Proposed Project; the Proposed Project would occur entirely within privately owned property.

Discussion of Checklist Responses

a. Increase Use of Existing Parks or Recreational Facilities — *No Impact*

As discussed in the *Population and Housing* section of this checklist, the Proposed Project is not expected to result in either short- or long-term population growth in the Project Area, so it would not result in increased recreational demand related to population growth. It would not modify or otherwise affect existing recreational facilities or resources, and thus is not expected to alter patterns of recreational demand or usage. No impact related to increased use of existing recreational facilities is anticipated, and no mitigation is required.

b. Creation of New or Altered Recreational Facilities — *No Impact*

The Proposed Project is entirely within private property and does not include a recreational component, and would not require the construction of new recreational facilities or expansion of existing facilities. There would be no impact related to new recreational facilities, and no mitigation is required.

3.16 TRANSPORTATION/TRAFFIC

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the Project:					
a.	Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☐	☒	☐	☐
b.	Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☒	☐	☐
c.	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d.	Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☒	☐	☐
e.	Result in inadequate emergency access?	☐	☒	☐	☐
f.	Result in inadequate parking capacity?	☐	☐	☐	☒
g.	Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g. bus turnouts, bicycle racks)?	☐	☒	☐	☐

Transportation and Traffic Terminology

Level of service (LOS) is a qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience. Roadway LOS is defined according to methodologies presented in the Highway Capacity Manual (Transportation Research Board 2000). Using the Highway Capacity Manual procedures, the quality of traffic operation is graded as one of six LOS designations: A, B, C, D, E, or F. LOS A and B represent the best traffic operations, LOS C and D represent intermediate operations, and LOS E and F represent high levels of congestion and unstable traffic flow.

Regulatory Setting

Traffic and transportation planning in unincorporated areas of Napa County is guided by the County General Plan, which includes overall goals for traffic and transportation, and also presents the County's level of service (LOS) standards for roadways and intersections, as follows.

- LOS D or better on all county arterial roadways, except where maintaining LOS D would require the installation of more travel lanes than are shown on the County's current Circulation Map.
- LOS D or better at all signalized intersections, except where the existing LOS is E or F and it is not feasible to increase intersection capacity without acquiring substantial additional right-of-way. The LOS standard for unsignalized intersections is evaluated on a case by case basis.

Environmental Setting

Regional access to the County is provided by State Highways 12, 29, 121, 128, 221 and Interstate 80. Within the County, State Highways 29/128 and Silverado Trail serve as the primary north-south roadways providing direct access to each of the incorporated areas of the valley. Traffic volume thresholds for the most congested County roadways are presented in **Table 3.16-1**.

Table 3.16-1. PM Peak Traffic Thresholds for Congested County Roadways

Roadway Segment	Roadway Type	PM Peak Volume Threshold (LOS D or better)
American Canyon Road - I-80 to Flosden Road	2 lane rural highway	1,380
Deer Park Road – Sanitarium Road to Silverado Trail	2 lane collector	1,460
Deer Park Road - Silverado Trail to SR 29/128	2 lane collector	1,460
Flosden Road – American Canyon Road to Solano/Napa County Line	4 lane urban arterial	3,270
Napa Valley Highway - Kaiser Road to SR 29	4 lane urban arterial	3,270
Petrified Forest Road - Foothill Boulevard to Franz Valley School Road	4 lane urban arterial	3,270
Silverado Trail – Oak Knoll Avenue to Hardman Avenue	2 lane rural arterial	1,380
Silverado Trail - Sage Canyon Road to Yountville Cross Road	2 lane rural arterial	1,380
Silverado Trail - Pope Street to Zinfandel Lane	2 lane rural arterial	1,380
Silverado Trail - Calistoga City Limits to Lincoln Avenue	2 lane rural arterial	1,380
Soscol Avenue - First Street to Silverado Trail	4 lane urban arterial	3,270
SR 12 - Cuttings Wharf Road to Stanly Lane	2 lane rural highway	1,380
SR 12 - Lynch Road to Kelly Road	4 lane rural highway	5,240
SR 128 - Napa/Sonoma County Line to Tubbs Lane	2 lane rural arterial	1,380
SR 128 – Tubbs Lane to Petrified Forest Road	2 lane rural arterial	1,380
SR 128 - Petrified Forest Road to Lincoln Avenue	2 lane rural arterial	1,380
SR 128 - Chiles-Pope Valley Road to Silverado Trail	2 lane rural arterial	1,380

Roadway Segment	Roadway Type	PM Peak Volume Threshold (LOS D or better)
SR 29 - Green Island Road to American Canyon Road	4 lane rural highway	5,240
SR 29 - Oakville Grade to Madison Street	2 lane rural highway	1,380
SR 29 - Rutherford Cross Road to Oakville Grade	4 lane rural arterial	5,240
SR 29 - Chaix Lane to Zinfandel Lane	4 lane rural arterial	5,240
SR 29 - Lodi Lane to Deer Creek Road	4 lane rural arterial	5,240
SR 29 – Kelly Road to Jamieson Canyon Road (SR 12)	4 lane rural arterial	5,240
SR 29 – Napa Valley Highway to Kelly Road	4 lane rural highway	5,240
SR 29 - Napa Valley Highway to Carneros Highway	6 lane freeway	10,360
Tubbs Lane - SR 29 to SR 128	2 lane rural highway	1,380

Source: Napa County 2007

Napa County experiences daily, weekly, and seasonal variations in traffic volumes and congestion that are related to the agricultural economy and tourist industry. Summer and fall months typically see the highest traffic volumes due to tourist travel and harvest activities. During these seasons, the majority of increased traffic volume occurs outside of the standard morning/evening peak traffic hours. A majority of roadway segments that may be used by construction contractors to access the Proposed Project sites are currently operating at an acceptable LOS (LOS D or better) and are projected to continue to operate at an acceptable LOS in the future. However, traffic data for the most recent year collected (2003) indicates that 13 out of 94 roadway segments in Napa County are experiencing unacceptable LOS of E and F. By the year 2030, the number of failing roadway segments is expected to increase to 27 (Napa County 2007). **Table 3.16-2** lists the roadway segments of concern that may be used by Project construction contractors to access the Project sites.

Table 3.16-2. Roadway Segments with Existing and Projected Peak Hour Unacceptable LOS

Roadway Segment	2003 Conditions	2030 Conditions
American Canyon Road: 1-80 to Flosden Road	LOS D	LOS F
Deer Park Road: Sanitarium Road to Silverado Trail	LOS C	LOS F
Deer Park Road: Silverado Trail to St Helena Highway (SR 29/128) (NB→EB)	LOS C	LOS E
Flosden Road: American Canyon Road to Napa/Solano County Line (NB→EB)	LOS C	LOS F
Napa Vallejo Highway: Kaiser Road to Highway 29	LOS D	LOS F
Petrified Forest Road: Foothill Blvd (SR 128) to Franz Valley School Road	LOS C	LOS F
Silverado Trail: Oak Knoll Ave to Hardman Ave	LOS C	LOS E
Silverado Trail: Sage Canyon Road (SR 128) to Yountville Cross Road	LOS C	LOS F
Silverado Trail: Pope Street to Zinfandel Lane (SB→WB)	LOS C	LOS F
Soscol Ave: First Street to Silverado Trail	LOS D	LOS F
SR 12/121: Cuttings Wharf Road to Stanly Lane	LOS D	LOS F
SR 12: Lynch Road to Kelly Road (NB→EB)	LOS F	LOS E
SR 121: Napa/Sonoma County Line to Old Sonoma Road	LOS F	LOS D
SR 128: Napa/Sonoma County Line to Tubbs Lane	LOS C	LOS F
SR 128: Tubbs Lane to Petrified Forest Road	LOS C	LOS E
SR 128: Petrified Forest Road to Lincoln Ave (SR 29)	LOS C	LOS F
SR 128: Chiles-Pope Valley Road to Silverado Trail	LOS C	LOS F
SR 29: Green Island Road to American Canyon Road	LOS F	LOS F
SR 29: Oakville Grade to Madison Street	LOS F	LOS F
SR 29: Rutherford Cross Road (SR128) to Oakville Grade	LOS F	LOS F
SR 29: Chaix Lane to Zinfandel Lane	LOS F	LOS F
SR 29: Lodi Lane to Deer Park Road	LOS D	LOS F
SR 29: Kelly Road to Jamieson Canyon Road (SR 12)	LOS C	LOS F
SR 29: Napa-Vallejo Highway (SR 221) to Kelley Road)(NB→EB)	LOS C	LOS F
SR 29: Napa-Vallejo Highway (SR 221) to Carneros Highway (SR 121/12) (NB Napa-Vallejo Highway (SR 221) (NB→EB)	LOS C	LOS F
Tubbs Lane: Highway 29 to Highway 128 (NB→EB)	LOS C	LOS E

Notes: If direction not specified, LOS indicated occurs in both directions of travel. Gray shading denotes unacceptable LOS.
Source: Napa County 2007.

Public Transit Services

Within the County fixed-route local, intercity, demand-response service, and paratransit services are provided as follows:

- Vine – provides intra-and inter-city fixed route services and operates in the city of Napa, between Calistoga and Vallejo, and between St. Helena and Santa Rosa.
- Downtown Napa Trolley – free shuttle service in downtown Napa.
- American Canyon Transit – fixed route service in American Canyon.
- Yountville Shuttle – fixed route service throughout Yountville, including to the Veterans Hospital.
- St. Helena Shuttle – fixed route service in St. Helena and to St. Helena Hospital.
- Calistoga Handy Van – a public dial-a-ride provider serving Calistoga.
- VINE GO – paratransit service providing curb-to curb service for residents countywide who live in the vicinity of a bus route.

Non-Motorized Transportation

Napa County's roadway system includes both off-street trails and pathways and on-street bicycle lanes. Sidewalks are confined to within individual cities. The following types of bike facilities are designated in the County:

- Class I Bike Path: specifically designated for the exclusive use of bicycles and pedestrians. Class I bike paths are separate from streets, although they may cross roadways.
- Class II Bike Lanes: striped lanes on a street or highway, designated for use by bicycles. Vehicle parking and vehicle pedestrian cross-flows are permitted at designated locations.
- Class III Bike Routes: usually designated by pavement markings to indicate the use of bicycles within the travel lane of a roadway.

Relatively long distances between cities and the dominant rural nature of the County make walking and inter-city bike travel uncommon outside of urban areas.

Discussion of Checklist Responses

a, b. Substantial Increase in Traffic — *Less than Significant with Mitigation*

Construction would generate four types of traffic: construction worker commute vehicles, mobilization and demobilization of heavy construction equipment, delivery of materials and supplies, and hauling of sediment and soil between work sites and for offsite disposal. Maintenance operations would result in additional, but much more infrequent, trips within the same general categories.

Construction Worker Trip Generation

As described in Chapter 2, project construction is expected to be phased over a period of 5 years, and no more than two of the project restoration sites would be under construction at any one time. Under this scenario, it is estimated that 15 or fewer workers would be onsite during construction. Construction of each site is expected to occur over a maximum 6- to 7-month timeframe and work would be limited to weekdays. Over the construction period, it is estimated that construction worker vehicles would add no more than 30 round trips, or 60 individual trips, to area roadways each day.

Heavy Equipment Deliveries

Construction equipment would be staged onsite, meaning that once onsite, equipment would remain onsite until construction has been completed. Transportation of equipment to (mobilization) and from (demobilization) the Project Area and movement of equipment between designated work sites would add a small number of additional trips. Additional trips would be generated by delivery of materials and supplies (e.g., plant material, irrigation pipes), which would likely occur several times per week, up to 1 round trip per day (2 individual trips).

Truck Trips Associated with Disposal of Excess Materials or Delivery of Fill for Bank Stabilization

The Proposed Project activities (channel widening, floodplain restoration, instream features, etc.) would generate approximately 490,000 cubic yards of material. Berm reconstruction and design requirements will reuse approximately 87,000 cubic yards. The remaining 403,000 cubic yards would be hauled offsite in 10 cubic yard dump trucks for various uses including general fill for nearby construction projects and soil for vineyard operations. This would result in approximately 50,000 round trips to remove excess materials over the life of construction. Additional haul trips may be necessary to transport materials from one restoration site to another if onsite soils at the receptor site are geotechnically unsuitable for berm construction or other reuse. An estimated 1,000 additional haul round trips would be required for this purpose. Earth-moving activities would occur over a total of approximately 500 days over the 5-year construction timeframe. Therefore, up to approximately 250 individual haul trips would occur per day (weekdays during the 6-month construction duration for each site, over a total of 5 years).

Temporary Lane Closures

Work would be staged and conducted in a manner that maintains two-way traffic flow on public roadways in the vicinity of the work site. However, occasional temporary lane closures on area roadways may be necessary for construction staging and equipment mobilization/demobilization activities. Lane closures on area roadways during peak hours could result in unacceptable LOS, and could result in severely limited traffic circulation on impaired roadways (those with peak hour LOS E or F in Table 3.16-2). In addition, lane closures could result in inadequate travel routes for cyclists and pedestrians and impair public transit routes and pickup/dropoff locations for transit riders.

Though lane closures associated with Project construction would be temporary, closures during peak hours on impaired roadways could result in significant circulation impacts over the 5-year construction period. To mitigate this potentially significant impact, the County

has proposed Environmental Commitment measure EC-15GEN (Planning for Pedestrians, Traffic Flow, and Safety Measures), which, among other benefits, would require work to be staged and conducted in a manner that maintains two-way traffic flow on public roadways to the maximum extent feasible. When temporary lane closures are necessary, they will be coordinated with the appropriate jurisdictional agency and scheduled to occur outside of peak traffic hours (7:00 – 10:00 a.m. and 3:00 – 6:00 p.m.) to the maximum extent practicable. Any lane closures will include advance warning signage, a detour route and flaggers in both directions. Bicycle and pedestrian facility closures will be scheduled outside of peak traffic hours to the maximum extent practicable. Public transit access and routes will be maintained in the vicinity of the work site. If public transit will be affected by temporary road closures and require detours, affected transit authorities will be consulted and kept informed of project activities. Implementation of this Environmental Commitment would result in a very small number of lane closures during peak hours over the duration of construction. Access to driveways and private roads will be maintained. If brief periods of maintenance would temporarily block access, property owners will be notified prior to maintenance activities.

Maintenance

Project maintenance activities would generate limited amounts of traffic (2–3 vehicles) to and from each of the maintenance sites, and most activities would not require the mobilization and demobilization of heavy equipment. As described in Chapter 2, maintenance activities and locations would vary each year based on need, and most activities would be accomplished within a relatively short time frame (2–3 days). Thus, the added volume of traffic generated on area roadways by routine maintenance is expected to be very small relative to roadway capacity and existing traffic volume. However, slow-moving equipment and haul vehicles could exacerbate already congested roadways during peak hours.

Summary

Up to approximately 250 individual daily trips would be generated by project construction from a combination of construction worker commute vehicles, mobilization and demobilization of heavy construction equipment, delivery of materials and supplies, and hauling of sediment and soil. This represents a small proportion (less than 1 percent) of daily traffic volume capacity on roadway segments in the Project Vicinity. However, if construction-related trips were to occur during peak hours (7:00 – 10:00 a.m. and 3:00 – 6:00 p.m.), Project-related traffic would represent a substantial increase in traffic volume (between 2 percent and 18 percent of peak hour thresholds) on congested roadways. For roadway segments and intersections that are currently experiencing or projected to experience unacceptable levels of service (LOS E or F), Project-related traffic volume increases would exacerbate the problem, resulting in a significant impact. Similarly, roadway segments and intersections currently operating at a marginally acceptable level of service (LOS D) could begin experiencing an unacceptable level of service (LOS E) with the addition of Project-related traffic. This, too, would result in a significant impact. To mitigate this impact, Mitigation Measure TR-1 is proposed. This mitigation measure would require preparation of a Traffic Control Plan (TCP), which requires construction-related vehicles and equipment to travel outside of peak hours on congested roadway segments to the maximum extent feasible and ensures coordination with the County to design a congested intersection avoidance strategy.

As described above, the increase of project maintenance-related vehicles would be minor relative to the capacity of roadways. However, slow-moving equipment and haul vehicles could exacerbate already congested roadways if traveling during peak hours. Mitigation Measure TR-1, among other benefits, would require slow-moving vehicles to travel outside of peak hours on impaired roadways during the maintenance phase, resulting in a less-than-significant circulation impact for the maintenance phase of the Project.

Impacts to circulation related to temporary lane closures would also be mitigated to a less-than-significant level through implementation of Mitigation Measure TR-1.

Mitigation Measure TR-1: Prepare and Implement Traffic Control Plan

The County of Napa shall ensure preparation and implementation of a Traffic Control Plan for construction and maintenance activities of the Proposed Project. At a minimum, the Plan shall require:

- Slow-moving vehicles to travel outside of peak hours on impaired roadways, and
- Coordination with the County to design a congested intersection avoidance strategy.

c. Change in Air Traffic Patterns — *No Impact*

There are no airports in the immediate Project vicinity, and the Project does not include any features related to airports or air traffic. There would be no impact on air traffic or airport service, and no mitigation is required.

d, e. Increased Hazards Due to Design Features, Inadequate Emergency Access — *Less than Significant with Mitigation*

The Proposed Project would not alter the physical configuration of the roadway network or introduce unsafe design features or incompatible uses into the area. Therefore, there would be no long-term impacts on roadway or intersection safety as a result of the project. During project construction, slow-moving construction vehicles entering, leaving, and traveling along area roadways could result in a short-term increase in traffic safety hazards. Additionally, emergency access within the Project Area could be affected by project construction; specifically, temporary lane closures and construction-related traffic could delay or obstruct emergency vehicles. Any of these impacts would be considered potentially significant if they were to occur. Mitigation Measure TR-1 would require the TCP to include provisions to ensure unobstructed emergency access and overall traffic safety. The County will be responsible for overseeing implementation of the plan. The same types of measures would be required during maintenance. With this plan in place, impacts would be mitigated to a less-than-significant level.

Mitigation Measure TR-1: Prepare and Implement Traffic Control Plan

See text of measure above in (b).

f. Inadequate Parking Capacity — *Less than Significant with Mitigation*

During project construction and maintenance, workers would park in designated staging areas. If space on the site is insufficient, workers may be inclined to park on residential streets or in winery parking lots, potentially resulting in inadequate parking capacity for residents and tourists. Mitigation Measure TR-1 includes a provision for the construction contractor to either provide adequate onsite parking, or provide offsite parking and a worker shuttle. The TCP prepared by the contractor will identify offsite parking locations and shuttling provisions (if required). The TCP will prohibit workers from parking on residential streets or in winery parking lots. With implementation of this mitigation measure, any potentially significant construction-related parking impacts would be reduced to a less-than-significant level.

Parking requirements for maintenance workers are expected to be minor and will be fully accommodated onsite.

Mitigation Measure TR-1: Prepare and Implement Traffic Control Plan

See text of measure above in (b).

g. Conflict with Alternative Transportation Policies — *No Impact*

The project focuses on river restoration, and does not propose any improvements or modifications that would conflict with existing or proposed alternative transportation policies, plans, or programs. There would be no impact, and no mitigation is required.

3.17 UTILITIES AND SERVICE SYSTEMS

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
Would the Project:					
a.	Exceed wastewater treatment requirements of the applicable RWQCB?	☐	☐	☐	☒
b.	Require or result in the construction of new water or wastewater treatment facilities or an expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c.	Require or result in the construction of new stormwater drainage facilities or an expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d.	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e.	Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f.	Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g.	Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒
h.	Have sufficient local or regional energy supplies available to serve peak and base period energy demands, or is additional capacity required?	☐	☐	☐	☒
i.	Comply with existing energy standards?	☐	☐	☐	☒
j.	Result in adverse effects on energy resources?	☐	☐	☒	☐

3.17 UTILITIES AND SERVICE SYSTEMS

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
k.	Result in a wasteful, inefficient or unnecessary consumption of energy during the project construction, operation, maintenance, and /or removal?	☐	☐	☐	☒

Setting

Water Supply, Wastewater Disposal, and Sanitary Sewers

Unincorporated areas of the County are primarily reliant upon groundwater resources and surface water collection for potable water (Napa County 2008). Based on current and future water demands, the County has adopted polices supporting the use of recycled water as a means to meet future water supply demands.

The Proposed Project would not affect water or wastewater demands or capacity needs. As such, these public facilities are not discussed in this setting section.

Stormwater Drainage

The Project Area is not served by City or County storm drain infrastructure. Information on stormwater drainage in the Project Area is provided in the *Hydrology and Water Quality* section of this checklist.

Solid Waste Disposal

Regulations

As described in the Napa County General Plan, the following plans related to solid waste are currently in place:

- 2002 Napa Countywide Integrated Waste Management Plan
- Summary Plan and Siting Element (Countywide)
- Source Reduction and Recycling Elements
- Household Hazardous Waste Elements
- Non-Disposal Facility Elements

In addition, the County adopted the "Waste Source Reduction and Recycled Product Content Procurement Policy" intended to reduce the amount of waste generated by the County's operations and encourage firms servicing the County to use recycled materials.

Policies contained in the Conservation Element of the Napa County General Plan are also intended to promote waste reduction and recycling.

Existing Conditions

Disposal will be determined annually and may vary for each construction phase. Most likely, excess soil will be off-hauled to nearby farms and vineyards for reuse. Off-haul locations will be within 10 miles from the project restoration site.

Napa County is served by five solid waste service providers and two joint power agencies/authorities (Napa County 2008). The majority of materials other than sediment would be taken to the Devlin Road Recycling and Transfer Facility where most of the County's solid waste is sorted and routed for disposal elsewhere. This facility is located at 889 Devlin Road in American Canyon, and operated by Northern Recycling Operations and Waste Services. The Devlin Road Transfer Station is also the site of the American Canyon Landfill and a hazardous waste collection facility serving households and small quantity business generators. The Devlin Road facility receives an average of 560 tons of waste a day, but has the capacity to handle up to 1,440 tons of daily waste (Napa County 2008). Items brought to the Devlin Road Facility are first assessed for recycling, reuse, or composting before being sent to the Keller Canyon Landfill for disposal (Napa Recycling and Waste Services 2013).

Keller Canyon Landfill, located in Pittsburg, CA, accepts solid waste, non-liquid industrial waste, contaminated soils, ash, grit, and sludges. The landfill is permitted to accept up to 3,500 tons of waste per day; however, current daily disposal volumes average 2,500 tons (Allied Waste 2013). A survey of landfill capacity conducted in 2006 indicated that the facility had 64.8 million cubic yards of remaining capacity and an estimated closure date of 2030 (Napa County 2008).

Discussion of Checklist Responses

a-c, e. Wastewater and Stormwater Generation or Treatment — *No Impact*

The Proposed Project would not increase population in the Project Area (see related discussion in *Population and Housing* section of this checklist), nor would it alter the distribution of population in the Project Area, either temporarily or permanently. The Proposed Project would not alter land use in a way that would increase wastewater generation. As identified above, the Project Area is not served by City or County storm drain facilities. The Proposed Project would not modify existing stormwater drainage facilities, nor would it construct new areas of impervious surface requiring storm drainage. It would result in some modifications to existing topography to restore channel geomorphology and construct the rolling levee berms. However, these modifications would take place in areas where storm runoff is conveyed by overland drainage, not by storm drain facilities, and the modifications would be designed to ensure appropriate site drainage.

Grading and site layout have been designed to avoid or minimize the impact to existing public utilities. No sewer lines would be impacted by the Proposed Project. Therefore, the Proposed Project would not alter the need for wastewater treatment in the County, and there would be no impact related to potential exceedance of wastewater treatment standards or requirements. It would not increase the need for wastewater treatment in the County, and there would be no impact related to the need for construction or expansion of wastewater treatment facilities. There would be no impact related to wastewater treatment

capacity. Furthermore, there would be no impact related to a need for new or expanded stormwater drainage facilities. No mitigation is required.

d. Potable Water Supply — *No Impact*

As discussed in item (a-c, e above), the Proposed Project would not increase population or alter the distribution of population in the Project Area, either temporarily or permanently, so it would not increase the need for potable water supply. The Project would not expand agriculture, and thus would not increase the demand for agricultural supply.

The proposed site designs have been developed with landowner input to avoid or minimize the impact to existing private utilities at each site. Landowners would be responsible for relocating private irrigation supply lines, pumps, wells, and water intakes where relocations are required No public groundwater wells or waters supply lines would be impacted by the Proposed Project. There would be no impact related to water supply availability, and no mitigation is required.

f, g. Solid Waste Disposal — *No Impact*

As discussed above, the Proposed Project would not increase area population, relocate residential uses, or otherwise alter land use in a way that would increase residential or commercial solid waste generation. In order to prepare the proposed restoration areas for earthwork, some vegetation would need to be removed, primarily riparian growth already at risk due to bank erosion and failure. The Proposed Project activities (e.g., channel widening, floodplain restoration, instream features) would generate approximately 490,000 cubic yards of material. Berm reconstruction and design requirements would reuse approximately 87,000 cubic yards. The remaining 403,000 cubic yards would be hauled offsite for various uses including general fill for nearby construction projects and soil for vineyard operations.

Following restoration, small volumes of greenwaste would continue to be generated periodically as a result of vegetation maintenance activities, including the removal of invasive nonnative species. Most or all of this material would be offhauled for composting, so it would not require disposal per se, and the volumes involved would be quite small, well within the capacity of local receiving facilities.

Overall, the Project's potential to increase waste generation would be very small. Project-related waste volumes could easily be accommodated as part of the Project Area's existing waste stream. Furthermore, wastes (primarily greenwaste) generated by the Proposed Project would be handled and disposed in accordance with all applicable federal, state, and local regulations and policies. The Proposed Project is not expected to exceed landfill capacity or result in impacts related to violation of solid waste regulations, and no mitigation is required.

h-I, k. Energy Demands — *No Impact*

As discussed above, the Proposed Project would not increase population or alter the distribution of population in the Project Area, either temporarily or permanently, so the Proposed Project would not increase demand for power generation nor would is it expected to result in impacts related to violation of energy standards. Project construction and maintenance activities would not wastefully, inefficiently, or unnecessary consume energy. There would be no impact to energy demands, and no mitigation is required.

j. Energy Utilities — *Less than Significant*

Channel widening activities may require limited joint pole relocation. The County and design engineers will coordinate joint pole relocation with PG&E and, to the extent practicable, amend design grading to integrate existing joint poles and provide continued maintenance access. In the event that poles would need to be moved, the disruption would be temporary. This impact would be less than significant, and no mitigation is required.

3.18 MANDATORY FINDINGS OF SIGNIFICANCE

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a.	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b.	Does the project have impacts that are individually limited but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☒	☐	☐
c.	Does the Project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

Discussion of Checklist Responses

a. Effects on Environmental Quality, Fish or Wildlife, and Historic Resources — *Less than Significant with Mitigation*

Wildlife Habitat and Populations; Rare and Endangered Species

Over the short term, construction would have some potential for adverse impacts on fish, wildlife, and the quality of habitat in the Project Area, through impacts on water quality, removal of vegetation, and construction-related disturbance, as discussed in Section 3.4 of this initial study checklist (*Biological Resources*). However, with the implementation of Environmental Commitments and Mitigation Measures BIO-1, BIO-2 and BIO-3, all of these impacts would be reduced to a level that is less than significant. Ongoing maintenance activities would have a similar potential to temporarily reduce habitat quality and/or disturb fish and wildlife. Maintenance impacts would also be less than significant with the implementation of Environmental Commitments and biological mitigation measures. Over the long term, the Project would improve geomorphic functions and aquatic and riparian

habitat quality. Impacts are thus evaluated as less than significant overall, assuming implementation of the Environmental Commitments identified in Chapter 2.

California History and Prehistory

As discussed in Section 3.5 of this checklist (*Cultural Resources*), the project footprint is entirely within sediments of Holocene age and thus is not considered sensitive for paleontological resources. However, records searches conducted for the Proposed Project at the Northwest Information Center identified that eleven of the parcels within the Project Area have been the subject of varying levels of archaeological survey, and prehistoric archaeological resources have been reported within or immediately adjacent to five of these parcels.

As in any area with a long history of human use and habitation, the Project Area may also contain additional unknown buried resources. The Project Area is thus considered highly sensitive for cultural resources, and project earthwork would have some potential to result in damage or loss affecting important documentation of California prehistory. To address this concern, the County has committed to:

- ensure that work areas near known archaeological site(s) are surveyed by a qualified prior to ground-breaking, with appropriate follow-up if needed (Mitigation Measure CUL-1);
- retain a qualified archaeologist, and a Native American representative acceptable to tribal authorities, both of whom will be present onsite to monitor site preparation and construction activities within or adjacent to known archaeological sites (Mitigation Measure CUL-2);
- stop work in the event buried cultural resources are discovered during any project-related activities; have the resources assessed by a qualified professional archaeologist; and implement appropriate treatment measures (Mitigation Measure CUL-3); and
- comply with requirements of the California Public Resources Code regarding treatment of human remains (Mitigation Measure CUL-4).

The County will be responsible for ensuring that these measures are properly implemented. With these measures in place, the potential for project-related activities to destroy or eliminate important examples of the major periods of California history or prehistory is evaluated as less than significant. No mitigation is required.

b. Cumulative Impacts — *Refer to discussion of specific impacts below for significance conclusions*

A cumulative impact refers to the combined effect of "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines Section 15355). As defined by the State of California, cumulative impacts reflect "the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time" (CEQA Guidelines Section 15355[b]).

Lead agencies may use a "list" approach to identify related projects, or may base the identification of cumulative impacts on a summary of projections in an adopted general plan or related planning document (CEQA Guidelines Section 15130[b]), also known as the "projection" approach. This document utilizes both approaches. The list approach was utilized by developing a list of past, present and reasonably foreseeable related projects, as shown in **Table 3.18-1**. In addition, the Napa County General Plan, Draft Environmental Impact Report (Napa County 2007) and Napa County Baseline Data Report (Napa County 2005) were used in considering potential cumulative impacts and the Proposed Project's contribution to any cumulative significant impacts.

Table 3.18-1. Summary of Related Projects

Related Activity	Scope of Activity	Activities that Could Potentially Affect Resources Similar to the Proposed Project
Napa River Rutherford Reach Restoration Project	4.5 miles of the Napa River; construction through October 2015.	Bank repair, grading, riparian plantings, channel excavation, and creation of instream habitat, among other activities.
Napa River/Napa Creek Flood Protection Project	6 miles of the Napa River/Napa Creek; construction through 2015.	Construction of floodplain terraces and upstream and downstream dry bypass culverts, bank stabilization, and lowering of old dikes, among other activities.
Napa County Stream Maintenance Program	Flood control channels and ditches throughout Napa County; ongoing.	Vegetation management, sediment removal, bank repair, trash clearing, among other activities.
Napa County Road Maintenance Program	Roadways throughout Napa County; ongoing.	Culvert repair, bank repair, grading, among other activities.
Napa County Stormwater Pollution Prevention Program	Throughout Napa County; ongoing.	Stormwater pollution prevention protection and enhancement of water quality in creeks and wetlands, and preservation of beneficial uses of local waterways, among other activities.
Napa River Sediment Total Maximum Daily Load and Habitat Enhancement Plan	Napa River watershed; ongoing.	Specifies actions that will reduce sediment inputs to the Napa River watershed and restore a healthy fishery in the watershed.
Napa County Climate Action Plan Project	Throughout Napa County; ongoing.	Specifies Environmental Commitments to reduce and quantify greenhouse gas emissions. Discretionary actions in the County would be asked to comply with the Environmental Commitments.
Health and Human Services Campus Project	8.5 acre redevelopment site in the City of Napa	Multi-year construction project requiring construction equipment and debris hauling to and from the City of Napa.
Napa County Jail Project	15-20 acre development site in Napa County	Multi-year construction project requiring construction equipment and debris hauling to and from the City of Napa. Once developed, increased traffic generation on County roads for day to day operation and activities.
Napa Pipe Project	150 acre development site in Napa County	Multi-year construction project requiring construction equipment and debris hauling to and from the site. Once developed, increased traffic generation on County roads for day to day operation and activities.

Related Activity	Scope of Activity	Activities that Could Potentially Affect Resources Similar to the Proposed Project
Suscol Mountain Vineyards Project	561 acre vineyard development site in Napa County	Vegetation removal, earth moving and grading activities associated with cultivation, installation and maintenance of drainage and erosion control features and runoff in the vicinity of Suscol creek.
Syar Napa Quarry Project	291 acre expansion project in Napa County	Construction project requiring construction equipment and debris hauling to and from the site.
Upper Range Vineyard Project, Rodgers Property	161 acre vineyard development site in Napa County	Vegetation removal, earth moving and grading activities associated with cultivation, installation and maintenance of drainage and erosion control features and runoff in the vicinity of Lake Hennessey.
Voluntary Oak Woodland Management Plan	Throughout Napa County; ongoing.	Plan to identify and protect the County's oak woodlands. Outline strategies and Environmental Commitments for protection of these areas from development and other damage.
Walt Ranch Vineyard Conversion	507 acre vineyard development site in Napa County	Vegetation removal, earth moving and grading activities associated with cultivation, installation and maintenance of drainage and erosion control features and runoff in the vicinity of Capell Creek and Miliken Reservoir watersheds.

Detailed analysis of a project's contribution to cumulative impacts is required when (1) a cumulative impact is expected to be significant, and (2) the project's contribution to the cumulative impact is expected to be cumulatively considerable, or significant in the context of the overall (cumulative) level of effect. **Table 3.18-2** summarizes cumulatively significant impacts and identifies the Proposed Project's contribution. Additional analysis is provided below the table for those impacts that the Proposed Project contributes to significant impacts.

Table 3.18-2. Summary of Cumulative Significant Impacts and Proposed Project's Contribution

Resource Topic	Cumulatively Significant Impacts	Proposed Project's Contribution
Aesthetics	None identified. The Napa County General Plan is strongly protective of aesthetic resources.	No analysis required.
Agricultural Resources	None identified. The Napa County General Plan identifies agricultural resources as the County's "primary land use" now and into the foreseeable future (Napa County 2008 p. AG/LU-10). Growth is stringently planned to preserve/protect agricultural land uses, and the General Plan identifies the importance of concentrating growth in the County's existing city and town areas.	No analysis required.
Air Quality	Napa County is a nonattainment area for the federal 1-hour ozone standard, a serious nonattainment area for the state 1-hour ozone standard, and a nonattainment area for the state PM_{10} and $PM_{2.5}$ standards. It is a marginal nonattainment area for the federal 8-hour ozone standard. Urbanized areas within the County are moderate maintenance areas for the federal CO standard. These impacts would be considered cumulatively significant.	Construction of the Proposed Project would not increase emissions of ozone precursors (NOx) or exhaust-based particulate matter above the BAAQMD cumulative threshold for significant air quality impacts. The Project's contribution would therefore be less than considerable. *Further discussion is provided below.*
Biological Resources	Past and present actions have significantly impacted anadromous salmonids and their habitat in the Project Area. Development and land use changes in the Napa River watershed could further decrease water quality and quantity, introduce non-native species or pathogens, and impede migration. These impacts would be considered cumulatively significant. Over the past 150 years, various land use practices the Napa River watershed have resulted in the loss of riparian habitat, wetlands, and oak woodlands and other sensitive natural communities. Special-status species, including California freshwater shrimp have also declined in distribution and abundance. Project-related actions which contribute to these impacts would be considered cumulatively significant.	The Proposed Project as a whole is anticipated to beneficially impact fisheries throughout the Project Area and Napa River watershed. However, the Proposed Project also has potential to temporarily decrease water quality, and reduce habitat quality. *Further analysis provided below.* Construction activities have the potential to impact special-status species, and would result in temporary impacts to sensitive natural communities. *Further analysis provided below.*

Resource Topic	Cumulatively Significant Impacts	Proposed Project's Contribution
Cultural Resources	Throughout California, the Native American cultural legacy, including culturally important sites and traditional cultural practices, has been substantially affected by land management practices and urbanization over the past century and a half. While the General Plans of the County and various jurisdictions contain policies regarding preservation of important cultural resources, ongoing development could lead to the cumulative loss of significant historic, archeological, or paleontological resources. This impact would be considered cumulatively significant.	As discussed in Section 3.5 of this checklist, the Project Area is known to contain five parcels with archaeological sites. As in any area with a long history of human use, the Project Area may also contain unknown buried resources. Project construction and maintenance thus have the potential for significant impacts on cultural resources, which could rise to a cumulatively considerable level. However, the County will implement mitigation measures that include prior survey of work areas near known archaeological sites, archaeologist and Native American monitoring of work in highly sensitive areas, and a "stop work" order followed by appropriate treatment if cultural resources are discovered during the Project's activities. The County will also comply with all applicable codes relative to treatment of human remains, if any are uncovered. With these measures in place, impacts on cultural resources are expected to be less than significant at the project level, and the Project would not make a considerable contribution to long-term regional loss of cultural resources. No further analysis is required.
Geology and Soils	None identified.	No analysis required.
Greenhouse Gas Emissions	Anthropogenic emissions of GHGs are widely accepted in the scientific community as contributing to global warming. This impact is considered cumulatively significant.	Vehicle and equipment use would result in emissions of GHGs. However, because such emissions would be below BAAQMD thresholds, in accordance with BAAQMD guidance, the Proposed Project would not make a considerable contribution to cumulative impacts related to GHG emissions. *Further discussion is provided below.*
Hazards and Hazardous Materials	None identified.	No analysis required.

Resource Topic	Cumulatively Significant Impacts	Proposed Project's Contribution
Hydrology and Water Quality	The Napa River has been identified as impaired for sediment pursuant to Clean Water Act Section 303[d]. Although the San Francisco Bay RWQCB is developing a TMDL program for sediment in the Napa River, the impairment has not yet been addressed and continues to represent a significant cumulative impact. The technical report prepared in support of the Napa River Sediment TMDL lists streambank erosion as a primary source of fine sediments in the Napa River (San Francisco Bay RWQCB 2005). In addition, over the past century, the Napa River has become increasingly incised and disconnected from its floodplain. This represents a significant cumulative impact on geomorphology and stream function.	During construction, the Proposed Project would incorporate numerous measures to prevent sediment from disturbed areas from reaching surface waters. Over the long term, the Proposed Project would help to reduce channel incision and bank erosion and thus is expected to reduce sediment input to the Napa River. The Napa River Sediment TMDL technical report (San Francisco Bay RWQCB 2005) specifically recommends implementation of projects to stabilize actively eroding streambanks, control channel incision, and restore aquatic habitat. Overall, the Project's impact on water quality would be beneficial; the Project would not make a considerable contribution to the existing cumulative impact related to sediment impairment, and no further analysis of cumulative water quality issues is required. The Proposed Project is specifically intended to restore the Oakville to Oak Knoll Reach to a more functional geomorphology. It would improve channel shape and function and restore connectivity between the mainstem channel and adjacent floodplain areas. This would represent a benefit for stream geomorphology and hydraulics; no further analysis of cumulative geomorphic/stream hydraulic issues is required.
Land Use and Planning	None identified.	No analysis required.
Mineral Resources	None identified.	No analysis required.
Noise	Reasonably foreseeable construction projects could combine in the same place and time and create a significant cumulative noise impact on sensitive receptors.	There are no sensitive receptors that would be in close proximity to both the Proposed Project and other reasonably foreseeable construction projects, Therefore, the Proposed Project would not have the potential to contribute to a cumulatively significant noise impact, and no further analysis is required.
Population and Housing	None identified.	No analysis required.
Public Services	None identified.	No analysis required.
Recreation	None identified.	No analysis required.

Resource Topic	Cumulatively Significant Impacts	Proposed Project's Contribution
Transportation and Traffic	Reasonably foreseeable future increased growth in traffic volumes in Napa County could affect load and capacity of the street system to the extent that level of service and emergency access is affected. This is considered a significant cumulative impact.	Although it would generate a comparatively small number of vehicle trips, project construction nonetheless has the potential to make a cumulatively considerable contribution to the existing cumulative impact on traffic flow in Napa County. Additional analysis of construction traffic impacts is provided below. Project maintenance activities would generate very limited amounts of traffic (2–3 vehicles) to and from each of the maintenance sites, most activities would not require the mobilization and demobilization of heavy equipment, and most activities would be accomplished within a relatively short time frame (2–3 days). Thus, the added volume of traffic generated on area roadways by routine maintenance is expected to be very small relative to roadway capacity and existing traffic volume. Maintenance traffic impacts were identified as less than significant at the project level, and are not expected to represent a considerable contribution to the existing cumulative impact on traffic flow. No further analysis of the project's maintenance traffic contribution is required.
Utilities and Service Systems	None identified.	No analysis required.

The following sections provide a detailed analysis of the Proposed Project's contribution to existing significant cumulative impacts. As identified in Table 3.18-2, the following resource issues are discussed: air quality, biological resources, global climate change, and traffic and transportation.

Air Quality: Emissions of Criteria Air Pollutants — Less than Significant

Principal air quality concerns for project construction and maintenance relate to (1) generation of fugitive dust during restoration earthwork and (2) exhaust emissions from construction equipment. As discussed above in this checklist, the County has committed to implement construction dust control measures consistent with the BAAQMD's guidance (Bay Area Air Quality Management District 2010) during all project-related activities, as well as providing a telephone number for the public to call with air quality complaints and designating a County staff member to ensure that construction-related air quality concerns are addressed promptly. With these commitments in place, construction-related emissions of criteria pollutants and air quality impacts on sensitive receptors near work sites would be less than significant at the project level for all criteria pollutants. In accordance with BAAQMD guidance (BAAQMD 2010; page 2-1), the BAAQMD thresholds of significance are

designed to serve also as cumulative thresholds of significance. Therefore, the Proposed Project's contribution toward significant air quality impacts would be less than considerable.

Biological Resources: Impacts to Special-Status Species and Sensitive Natural Communities – Less than Significant with Mitigation

Fisheries – Conversion of riparian habitat to farmland, water diversions, and the introduction of nonnative plant and animal species have substantially changed aquatic habitat in the Project Area. Most notably, Chinook salmon and steelhead have experienced a significant cumulative impact from past and present anthropogenic actions. The Proposed Project is intended to improve conditions for these species. That said, the Proposed Project could have several potentially adverse effects including temporarily decreasing water quality and reducing riparian habitat. While temporary impacts would occur, they would not make a cumulatively considerable incremental contribution to the decline of aquatic habitat, fall-run Chinook salmon, or steelhead. The overall contribution of the Proposed Project would be beneficial.

California freshwater shrimp (CFS) – Existing populations of California freshwater shrimp are threatened by introduced fish, deterioration or loss of habitat resulting from water diversion, impoundments, livestock activities, agricultural activities and developments, flood control activities, migration barriers, and water pollution (U.S. Fish and Wildlife Service, 2007). The declines in this species are the result of the synergistic effects of anthropogenic activities, and not a single causative agent or project. Thus, by definition, cumulative impacts are threatening the viability of the species. While the Proposed Project would impact suitable CFS habitat, the habitat that would be impacted is generally low quality, and would be replaced by habitat features specifically designed to create and improve CFS habitat. The temporal loss of CFS habitat, and the potential take of individual CFS during construction would be minimized through the creation of substantially more habitat than currently exists and implementation of mitigation measures (See Mitigation Measures BIO-1a and BIO-1b). With these measures in place, the incremental contribution of the Proposed Project would not be cumulatively considerable.

Riparian Habitat and other Sensitive Natural Communities – Historically, the Napa Valley contained wide expanse of Valley Oak Woodlands interspersed with wetlands, swales and riparian habitats. Past anthropogenic activity, especially conversion to farmland and developed land use, has substantially changed vegetation communities and the ecology of the Project Area. Sensitive natural communities including riparian habitats are not likely to recover from these impacts in the foreseeable future, and continued development is likely. While the Proposed Project would have temporary adverse effects on sensitive natural communities and associated wildlife species, it would expand the distribution of these communities over the long-term and improve their functions and values. Thus, the overall contribution of the Proposed Project would be beneficial, and short-term impacts would not be cumulatively considerable.

Greenhouse Gas Emissions: Emissions of GHGs — Less than Significant

GHG emissions contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change. Climate change impacts may include an increase in extreme heat days, higher concentrations of air pollutants, sea level rise, impacts to water

supply and water quality, public health impacts, impacts to ecosystems, impacts to agriculture, and other environmental impacts. No single project could generate enough GHG emissions to noticeably change the global average temperature. The combination of GHG emissions from past, present, and future projects contribute substantially to the phenomenon of global climate change and its associated environmental impacts.

The Proposed Project would require the use of construction equipment that emits GHG and thus may have some potential to contribute to climate change. The Proposed Project would also result in an overall increase in permanent new woody riparian vegetation relative to baseline conditions, resulting in an increased carbon sequestration value of the Project Area. As described in Section 3.3 (*Greenhouse Gas Emissions*), project-related emissions would be well below the established BAAQMD threshold of 1,100 metric tons per year of carbon dioxide equivalents ($MTCO_2e$). Because GHG emissions are by nature a cumulative problem, the BAAQMD mass emissions threshold for GHG emissions also serves as the cumulative emissions threshold in accordance with BAAQMD guidelines (BAAQMD 2010; page 2-1). Because the project would result in GHG emissions at a level that is less than the threshold, the contribution of the Proposed Project toward a cumulatively significant impact would be less than considerable. No mitigation is required; however, Mitigation Measure AQ-1, developed to reduce NOx emissions, would also incidentally reduce the Proposed Project's CO_2 equivalent emissions.

Traffic and Transportation: Effects to Level of Service and Emergency Access from Traffic Generation — Less than Significant with Mitigation

Construction would generate four types of traffic: construction worker commute vehicles, mobilization and demobilization of heavy construction equipment, delivery of materials and supplies, and hauling of sediment and soil between work sites and for offsite disposal. Maintenance operations would result in additional, but much more infrequent, trips within the same general categories. As discussed in Section 3.16 (*Transportation/Traffic*) of the checklist, this is expected to translate to no more than about 30 round trips or 60 individual trips to area roadways each day due to workers commuting to the project restoration sites, plus a very small number (up to 14 trips per week total) of additional trips for mobilization and demobilization of heavy construction equipment, and deliveries of materials and supplies.

The majority of construction-related traffic trips would be excess soil off-haul trips, resulting in approximately 250 individual haul trips would occur per day (weekdays during the 6-month construction duration for each site, over a total of 5 years).

While most of the principal roadway segments that would serve as construction access routes are operating at an acceptable level of service (LOS), certain segments are operating at an unacceptable LOS and are projected to do so in the future (during the 5-year construction timeframe of the Proposed Project). For roadway segments and intersections that are currently experiencing or projected to experience unacceptable levels of service (LOS E or F), Project-related traffic volume increases would exacerbate the problem, resulting in a significant impact. Similarly, roadway segments and intersections currently operating at a marginally acceptable level of service (LOS D) could begin experiencing an unacceptable level of service (LOS E) with the addition of Project-related traffic. This, too, would result in a significant impact. To mitigate this impact, Mitigation Measure TR-1 is proposed. This mitigation measure would require preparation of a Traffic Control Plan

(TCP), which requires construction-related vehicles and equipment to travel outside of peak hours on congested roadway segments to the maximum extent feasible and ensures coordination with the County to design a congested intersection avoidance strategy. With this mitigation measure in place, the Proposed Project activities would have a very low chance of contributing to a cumulatively significant traffic impact (exacerbating traffic conditions in combination with existing and projected roadway traffic). Therefore, the Proposed Project's contribution to a cumulatively significant traffic impact would be less than considerable with mitigation incorporated. No additional mitigation is required.

c. Effects on Human Beings — *Less than Significant*

All of the potentially adverse effects identified in this initial study would be avoided or reduced by Environmental Commitments incorporated into the Project, or would be mitigated to a less than significant level by implementation of measures identified in this document. No substantial adverse effect on human beings would result. The Project is designed to improve stream function and habitat quality along the Oakville to Oak Knoll Reach of the Napa River, reducing the potential for catastrophic flooding and benefiting fish and wildlife that use the River, and thus would also benefit the overall quality of life for County residents and visitors.

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Chapter 4
ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would potentially be affected by this Project, as indicated by the checklist on the preceding pages.

[X] Aesthetics	[ ] Agricultural and Forestry Resources	[X] Air Quality
[X] Biological Resources	[X] Cultural Resources	[ ] Geology / Soils
[ ] Greenhouse Gas Emissions	[ ] Hazards and Hazardous Materials	[ ] Hydrology / Water Quality
[ ] Land Use / Planning	[ ] Mineral Resources	[ ] Noise
[ ] Population / Housing	[ ] Public Services	[ ] Recreation
[X] Transportation/Traffic	[ ] Utilities / Service Systems	[X] Mandatory Findings of Significance

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Chapter 5
DETERMINATION

The conclusions and recommendations contained herein are professional opinions derived in accordance with current standards of professional practice. They are based on a review of the Napa County Environmental Resource Maps, the other sources of information listed in the file, and the comments received, conversations with knowledgeable individuals; the preparer's personal knowledge of the area; and, where necessary, a visit to the site. For further information, see the environmental background information contained in the permanent file on this project.

On the basis of this initial evaluation:

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

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

_____ _____

Signature Date

Name:_____

Napa County Planning, Building, Environmental Services Department

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Chapter 6
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Chapter 7
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