Napa River Rutherford Reach Restoration Project
Phase 3, Reach 4 and Phase 4A, Reach 8A North (Foley Johnson), Final Project Report

FINAL PROJECT REPORT

Napa County, California

June 2014

Reach 8A, April 2014

Grant and Funding Summary

US EPA Agreement No. W9-00T60801-0 (Subproject 1)	
San Francisco Bay Water Quality Improvement Fund	$ 450,000
CDPR Agreement No. HA-28-001	
Habitat Conservation Fund: Anadromous Fish Habitat	$ 400,000
SWRCB Agreement No. 11-093-552	
Federal Clean Water Act Section 319(h) Grant	$ 750,000
Napa County	
Measure A Watershed Improvement Funds (Design)	$ 431,000
Measure A Watershed Improvement Funds (Construction)	$1,600,000

TOTAL Phase 3, 4A; Reach 4 and 8A Final Design and Construction $3,931,000

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GRANT AGREEMENTS

US EPA Agreement No. W9-00T60801 (Sub-Project 1)
CDPR HCF Agreement No. HA-28-001
SWRCB Agreement No. 11-093-552

FINAL PROJECT REPORT
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1. PROJECT SUMMARY

1.1 Project Location and Background

The Napa River Rutherford Reach Project site is comprised of a 4.5-mile reach of the Napa River located just south of the City of St. Helena, in Napa County, California. The Rutherford Reach extends downstream from Zinfandel Lane to Oakville Cross Road. The Rutherford Reach is subdivided into nine sub reaches based on differences in channel morphology and restoration needs, which are numbered in a downstream direction. Reaches 1 through 4 are located between Zinfandel Lane and Rutherford Cross Road. Reaches 5 through 9 are located between the Rutherford Cross Road and the Oakville Cross Road. Final engineering and revegetation plans have been prepared for the entire Rutherford Reach, and the Project is being constructed in five phases between 2009 and 2014.

This Project Report addresses the final design and construction of Phase 3 of the Project in Reach 4, as well as the instream bench constructed on the Foley Johnson property located in Reach 8A north. Construction took place between 2011-2012 in Reach 4, and from 2012-2013 on Reach 8A (Foley Johnson). This phase of Project constructional funded by grants from the United States Environmental Protection Agency, the California Department of Parks and Recreation, and the State Water Resources Control Board (SWRCB), matched with Napa County Measure A funds.

1.2 Purpose and Objectives

The objectives established of the Napa River Rutherford Reach Restoration Project are to address the Total Maximum Daily Load (TMDL)identified problems of sedimentation by working collaboratively with river side landowners, Napa County and regulatory agencies to manage river bank erosion and channel incision; reduce the impacts of flooding; protect and enhance fish and

wildlife habitat; reduce Pierce's disease pressure on vineyards; and provide ongoing education about the river and its watershed.

More specifically, restoration implementation includes wholesale levee setbacks to widen the river channel; revegetation and installation of associated irrigation systems to re-establish a native riparian corridor; construction of bank stabilization measures to reduce inputs of fine sediment to the channel to enhance salmonid spawning habitat and to prevent property loss; installation of instream structures to enhance aquatic habitat; and construction of instream floodplain benches to enhance salmonid rearing habitat. Pre-existing infrastructure is reinstalled (generally set back from the riverbank) as part of the restoration as necessary. Communication and coordination with stakeholders, including landowners, occurs throughout the entire planning, construction, and monitoring phases of the Project.

The predicted outcome of this project is that instream and riparian habitat will improve due to; increased channel stability; decreased sedimentation; and enhanced instream and riparian habitat complexity. As a result, long-term benefits are predicted to include increasing native fish and bird populations and wildlife diversity in the Rutherford Reach of the Napa River. A long-term monitoring program has been designed to evaluate the Project over time.

1.3 Problem Statement

The Napa River is located in the Coast Ranges and discharges to San Pablo Bay in the northern part of San Francisco Bay. The basin spans 426 square miles. The beneficial uses of the Napa River include:

- Cold freshwater habitat (COLD)
- Fish migration (MIGR)
- Preservation of rare and endangered species (RARE)
- Fish spawning (SPWN)
- Warm freshwater habitat (WARM)
- Water contact recreation (REC1)
- Noncontact water recreation (REC2)

Once a broad, shallow system with multiple channels, the Napa River is now confined to a single, deeply incised channel with agricultural berms constructed in some areas by individual property owners in an attempt to protect vineyards and related infrastructure from flooding. These berms, however, are discontinuous and do not provide reach-wide flood protection.

1.4 Pollution Source Categories

The Napa River is on the Environmental Protection Agency's 303(d) list of impaired water bodies for sediment, nutrients and pathogens. Salmon and steelhead fish spawning habitat is impaired by excessive fine sediment. The source of the sedimentation in the Rutherford Reach is generally attributed to bank erosion and stream incision. The Regional Water Quality Control Board

(RWQCB) adopted the TMDL Implementation Policy Statement to control sediment waste discharges to impaired water bodies so that the TMDLs are met, sediment water quality objectives are attained, and beneficial uses are no longer adversely affected by sediment. The water quality objectives of this project are to reduce turbidity, sediment, and suspended and fine material with the goal of improving in-stream and riparian habitat, and other supported beneficial uses.

1.5 Baseline Data

In 2002, the Rutherford Dust Society River Restoration Team (RDRT or "Our Dirt"), a group of landowners with properties adjoining a 4.5-mile reach of the Napa River near Rutherford, initiated a plan to manage and restore habitat in the River. The goal was to produce a master plan based on a comprehensive analysis of the overall health of the Napa River as it flows through Rutherford fitting into the framework of the overall Napa River watershed. Since then, RDRT has teamed with various agencies to accomplish this goal, including Napa County, the Napa County Flood Control and Water Conservation District, and the Napa Resource Conservation District.

To date, research has been conducted to document river morphology; characterize bedload, gravel storage, and embeddedness; catalogue bank erosion; measure flood potential; evaluate fish habitat for threatened steelhead and Chinook salmon; and map the prevalence of native and non-native riparian plant species and Pierce's Disease host species. A Conceptual Plan was created that identified the areas that require restoration, how the restoration will affect and protect vineyard lands, and recommended restoration approaches. A preliminary design has been developed for the entire 4.5 mile reach and a California Environmental Quality Act (CEQA) review was completed through an Initial Study Mitigated Negative Declaration (IS/MND) issued by Napa County in 2008. A Project Assessment and Evaluation Plan (PAEP) and associated QAPP was prepared for, and approved by, the San Francisco Bay Area Regional Water Quality Control Board for the overall Rutherford Reach of the Napa River. The Environmental Protection Agency subsequently approved the PAEP and QAPP specifically for the grant associated with restoration of Phase 3 and 4A, Reach 4 and 8A.

The goal of this Project is to incorporate channel hydro-modification, in-stream habitat structures, and channel bank Best Management Practices (BMPs) to reduce sedimentation from channel incision and bank erosion.

1.5 Regulatory Permits

The Project has been permitted in its entirety by the U.S. Army Corps of Engineers (404 Permit 2008-00366N), the U.S. Fish and Wildlife (Section 7 Consultation/Biological Opinion 81420-2009-F-0266-1), and NOAA-National Marine Fisheries Service (Biological Opinion Tracking Number 2008/08010). The San Francisco Bay Area Regional Water Quality Control Board issued separate 401 Water Quality Certifications for Phase 3: Reach 4 (Site No. 02-28-C0377, CIWQS Place No. 763994) and Phase 4: Reach 8 (CIWQS Place No. 7780033). The Department

of Fish and Wildlife issued separate 1601 Streambed Alteration Permits for Phase 3: Reach 4 (No. 1600-2011-0036-R3) and for Phase 4:Reach 8 (1600-2012-0074-R3).

2. PHASE 3 AND 4A (REACH 4 AND REACH 8 NORTH [FOLEY JOHNSON]) MANAGEMENT AND MONITORING ACTIVITIES

2.1 Grant Phase Location

Phase 3a: Reach 4 East Bank was completed in summer 2011.Phase 3 spans 4,000 feet between river stations 16,000 and 12,000 on the Carpy-Conolly, Honig and Round Pond East properties, completing left (east) bank construction between the Zinfandel Lane and Rutherford Cross Road Bridges.

Phase 3b: Reach 4 west bank construction was completed in summer 2012, between river stations 16,000 and 12,000 on the Emmolo, Caymus (Mee prior to 2013), and Round Pond West properties, completing restoration construction on all properties between the Zinfandel Lane and Rutherford Cross Road Bridges.

Phase 4a: Reach 8A north construction at Foley Johnson (Sawyer prior to 2012) commenced in 2012 and was completed during summer 2013 and extends between river stations 7,625 and 7,300, located on the west bank midway between the Rutherford Cross Road and Oakville Cross Road Bridges.

2.2 Funding

County funded the final design of Phase 3, Reach 4 with Measure A funds in the amount of $431,000. Phase 3, Reach 4 implementation was funded by four grants totaling $1,600,000 from the United States Environmental Protection Agency; the California Department of Parks and Recreation; and the State Water Resources Control Board. Napa County matched these implementation grants with $1,580,000 in Measure A funds. See Table 1 for individual grant and match amounts. Upon completion of construction of Reach 4 West; $64,692 of the awarded SWRCB 319(h) grant funds and $15,288 of County match funds remained. Through an amendment to the SWRCB grant contract, these excess funds were allocated to complete of a portion of the Reach 8 construction on the Foley Johnson property in summer 2013.

Ongoing post construction project monitoring and maintenance for the entire project is funded through a reach-wide parcel assessment by landowners in the Rutherford Reach.

Table 1. Funding Summary

Funding Source	Napa County Measure A	Grants	Total
Measure A Flood Protection and Watershed Improvement Sales Tax Funds	$431,000	$0	$0
DESIGN FUNDING	**$431,000**	**$0**	**$431,000**
San Francisco Bay Water Quality Improvement Fund US EPA Agreement No. W9-00T60801-0	$430,000	$450,000	$830,000
California Department of Parks and Recreation Habitat Conservation Fund: Anadromous Fish Habitat CDPR HCF Agreement No. HA-28-001	$400,000	$400,000	$800,000
Federal Clean Water Act Section 319(h) Grant SWRCB Agreement No. 11-093-552	$750,000	$750,000	$1,500,000
CONSTRUCTION FUNDING	**$1,580,000**	**$1,600,000**	**$3,180,000**
TOTAL PROJECT FUNDING	**$2,011,000**	**$1,600,000**	**$3,611,000**

2.3 Grant Tasks and Deliverables

The following section summarizes the specific tasks and deliverables required under each contract with the three grantors that funding the construction of Phase 3 and 4A, Reach 4 and 8A: the United States Environmental Protection Agency; the California Department of Parks and Recreation; and the State Water Resources Control Board.

US EPA Agreement No. W9-00T60801-0 Sub Project 1

Task	Timeline	Outputs
1.1 Monitoring Plan and QAPP	Submitted by May 2011	Updated QAPP and Monitoring Plan for Reach 4 and 8
1.2 Permitting	Submitted by May 2011	All required Project permits for Reach 4 and 8
1.3 Project Implementation	Construction: June 2011 to December 2011. Revegetation: December 2011 to April 2012	-100% Construction Plans and Specifications <u>Construction of:</u> -approximately 1600 linear feet of setbank agricultural berms and associated riparian corridor widening -2 streambank stabilization and sediment reduction treatment areas -4 created floodplain terraces and associated habitat enhancement features
1.4 Project Management and Reporting	June 2011 to December 2012	-Quarterly Reports and Invoices -Final Report with As-builts and Pre/Post Construction Photos

California Department of Parks and Recreation Habitat Conservation Fund: Anadromous Fish Habitat Grant Agreement No. HA-28-001

Install instream fish habitat structures and restore riparian vegetation along an approximately 0.76 mile Subreach of the Napa River.

This Final Grant Report documents the successful installation of fish habitat structures and riparian vegetation along 0.76 miles of the Napa River in Reach 4 and Reach 8A north on the Foley Johnson property of the Rutherford Reach Restoration Project.

SWRCB Agreement No. 11-093-552

NAPA RIVER RUTHERFORD REACH RESTORATION: PHASE III IMPLEMENTATION **PURPOSE**. State shall provide a grant to and for the benefit of Grantee for the purpose of implementing additional restoration by reducing rates of bank erosion, enhancing fish and wildlife habitat, and mitigating flood damage for the Rutherford Reach.			
ITEM	**DESCRIPTION**	**DUE DATE**	**SUBMITTED**
EXHIBIT A – SCOPE OF WORK – WORK TO BE PERFORMED BY THE GRANTEE			
A.	PLANS AND GENERAL COMPLIANCE REQUIREMENTS		Completed
1.	Stream Reach and all HUC-12s for Project site and monitoring locations	Day 90	Completed
2.	Project Assessment and Evaluation Plan (PAEP)	Previously submitted; pending Grant Manager Approval	Completed
	Non Point Source Pollution Reduction Project Follow-up Survey Form	Annually by 12/15	12/2012
3.	Monitoring Plan (MP)	Previously submitted; pending Grant Manager Approval	Completed
	Monitoring Reports	Annually	February 2012 March 2013 May 2014
4.	Quality Assurance Project Plan (QAPP)	Previously submitted; pending Grant Manager Approval	Completed
5.	Proof of Water Quality Data Submission to CEDEN	If applicable	Completed
6.	Copy of final CEQA/NEPA Documentation	Previously submitted; pending Grant Manager	Completed

NAPA RIVER RUTHERFORD REACH RESTORATION: PHASE III IMPLEMENTATION **PURPOSE**. State shall provide a grant to and for the benefit of Grantee for the purpose of implementing additional restoration by reducing rates of bank erosion, enhancing fish and wildlife habitat, and mitigating flood damage for the Rutherford Reach.			
ITEM	**DESCRIPTION**	**DUE DATE**	**SUBMITTED**
		Approval	
7.	Public Agency Approvals, Entitlements or Permits	As Needed	
B.	PROJECT-SPECIFIC REQUIREMENTS		
1.	Project Construction		
1.1	Notice to Proceed Prior Advertising the Construction Bid	March 2012	Completed
1.5	Notice to Proceed Prior to Beginning Construction	2012	Completed
1.15	Pre- and Post-Construction Photo Documentation	2013	Completed
1.16	"As-built" Drawings	2013	Completed

SWRCB Agreement No. 11-093-552

EXHIBIT B – INVOICING, BUDGET DETAIL, AND REPORTING PROVISIONS			
ITEM	**DESCRIPTION**	**DUE DATE**	**SUBMITTED**
A.	INVOICING	Quarterly	Final Invoice Pending
F.	REPORTS		Completed
1.	Progress Reports by the twentieth (20th) of the month following the end of the calendar quarter (March, June, September, and December)	Quarterly	Completed
2.	Draft Project Report	2014	Completed
3.	Final Project Report	2014	Completed
4.	Final Project Summary	Before Final Invoice	Herein
6.	Final Project Inspection and Certification	Before Final Invoice	Following Final Invoice
EXHIBIT D – GRANT PROGRAM TERMS & CONDITIONS			
1.	Lobbying Certification	With Final Report	N/A
2.	MBE/WBE Documentation (http://www.epa.gov/osbp/pdfs/5700_52a.pdf)	Quarterly	Completed

2.4 Design

Phase 3, Reach 4, and Phase 4a, Reach 8 north, final design was completed by ESA PWA.

2.5 Construction Implementation

Phase 3a: Reach 4 East Bank was completed in summer 2011.Phase 3 spans 4,000 feet between river stations 16,000 and 12,000 on the Carpy-Conolly, Honig and Round Pond East properties, completing left (east) bank construction between the Zinfandel Lane and Rutherford Cross Road Bridges. The construction contractor was Siteworks. The revegetation contractor was SMP Services.

Phase 3b: Reach 4 west bank construction was completed in summer 2012, between river stations 16,000 and 12,000 on the Emmolo, Caymus (Mee prior to 2013), and Round Pond West properties, completing restoration construction on all properties between the Zinfandel Lane and Rutherford Cross Road Bridges. The construction contractor was Team Ghilotti, Inc. The revegetation contractor was SMP Services.

Phase 4a: Reach 8A north construction at Foley Johnson was completed during the summer 2013 and extends between river stations 7,625 and 7,300, located on the west bank midway between the Rutherford Cross Road and Oakville Cross Road Bridges. The construction contractor was Siteworks. The revegetation contractor was Hanford ARC.

2.6 Restoration Elements Installed

A summary of installed restoration elements is detailed in **Table 3**. Phase 3 Reach 4 construction included wholesale setback of the levee along the left (east) and right (west) banks of the river to stabilize and reduce sediment loads into the river and widen the riparian corridor; excavation of nine (9) instream floodplain benches to widen the overall functional width of the river and create slow water habitat for salmonids; grading of three (3) bank stabilization areas; installation of sixteen (16) instream Large Woody Debris (LWD) structures, root wads and low profile logs, trenched into constructed benches to provide additional refugia for native migrating fish; installation of nine (9) boulder clusters to provide geomorphic complexity and refugia for salmonids; and installation of a boulder field structure to create riffle habitat and assist in prevent further incision of the river channel and protect installed restoration features upstream. A total of 10.2 acres of riparian habitat was restored. The 5.6 acres of graded area on the benches bank stabilization areas were replanted with native riparian vegetation and erosion control seeding. An additional 4.6 acres of riparian outside the graded area were managed for invasive species and Pierce Disease host plants. See Figure 1 for an illustration of restoration elements installed in Phase 3, Reach 4, and Tables 3 and 4 for a summary of these features and their locations relative to the nine reaches of the Napa River Rutherford Reach Restoration Project.

Table 2. Reach 4 and Reach 8A (Foley Johnson) Constructed Restoration Feature Summary

Graded River Restoration Elements

Instream Floodplain Benches	9
Bank Stabilization Areas	4
Instream Floodplain Benches & Bank Stabilization Areas	3,130Linear Feet
Instream Floodplain Benches & Bank Stabilization Areas	5.6 Acres
Setback Berm	8,665 Linear Feet

Instream Habitat Structures

Large Woody Debris Structures	17
Boulder Clusters	12
Boulder Field	1

Riparian Habitat Restoration

Restored Riparian Habitat*	10.2 Acres

*Riparian area replanted with container and plug stock; does not include graded areas that were hydroseeded only.
Sources: Jeremy Sarrow, Napa County Flood Control and Water Conservation District; Gretchen Hayes, Tessera Sciences; ESA PWA, January 31,2013.

Graded Structures

Phase 3a was constructed in 2011 on the east bank of Reach 4. Graded restoration elements in Phase 3a: Reach 4 East Bank include: four (4) instream benches and two (2) bank stabilization areas. A total of 1,335 feet of channel banks were treated with grading in Phase 3a. Bench 7 spans 265 linear feet between left (east) bank river stations 15,840 – 15,575 on the Carpy-Conolly property. Bench 7 functions as edgewater habitat. Bank Stabilization Area 1 spans 150 linear feet between left (east) bank river stations 14,450 – 14,300 on the Carpy-Conolly property. Bank Stabilization Area 1 functions as edgewater habitat. Bank Stabilization Area 2 spans 75 linear feet between left (east) bank river stations 13,900-13,825 on the Honig property at the base of the confluence separating the Carpy-Conolly and Honig properties. Bank Stabilization Area 2 functions as high flow refugia. Bench 11 spans 230 linear feet between left (east) bank river stations 13,680 – 13,450 on the Honig property. Bench 11 functions as edgewater habitat. Bench 13 spans 425 linear feet between left (east) bank river stations 13,150 – 12,725 on the Honig property. Bench 13 functions as a secondary channel. Bench 14 spans 190 linear feet between left (east) bank river stations 12,580 – 12,390 on the Round Pond east bank property. Bench 14 functions as an edgewater habitat.

Phase 3b was constructed in 2012 on the west bank of Reach 4. Graded restoration elements in Phase 3a: Reach 4 West Bank include: five (5) instream benches and one (1) bank stabilization area. A total of 1,470 feet of channel banks were treated with grading in Phase 3b. Bench 6 spans 325 linear feet between right (west) bank river stations 16,125-15,800 on the Emmolo property. Bench 6 functions as edgewater habitat. Bench 8 spans 200 linear feet between right (west) bank river stations 15,275-15,075 on the Emmolo property. Bench 8 functions as edgewater habitat. Bench 9 spans 70 linear feet between right (west) bank river stations 14,085-14,015 on the

Caymus (Mee prior to 2013) property. Bench 9 functions as edgewater habitat. Bench 10 spans 415 linear feet between right (west) bank river stations 13,915-13,500 on the Caymus (Mee prior to 2013) property. Bench 10 functions as edgewater habitat. Bench 12 spans 200 linear feet between right (west) bank river stations 13,300-13,100 on the Round Pond west bank property. Bench 12 functions as edgewater habitat. Bank Stabilization Area 3 spans 260 linear feet between right (west) bank river stations 12,800-12,540 on the Round Pond west bank property. Bank Stabilization Area 3 functions to protect the Colinas Farming Shop building and functions as edgewater habitat.

Phase 4a: Construction of the (1) one bank stabilization feature on the right bank of Reach 8A north on the Foley Johnson property spans approximately 325 linear feet between stations 7,625-7,300 and was completed in 2013 following the delayed relocation of a PG&E power pole.

Instream Habitat Structures

Twelve (12) instream habitat structures were installed in Phase 3a, Reach 4 east bank in 2011: three (3) roots wads embedded in created instream benches, five (5) low profile log instream structures, and four (4) instream boulder clusters. The three (3) root wads, which have the trunk embedded in the bank and the root wad in the channel, were installed on the left (east) bank at river stations 13,070 on Bench 11, 12,800 on Bench 13, and 12,420 on Bench 14. The five (5) low profile logs, which have the root wad embedded in the bank and the canopy in the channel, were installed on the left (east) bank at river stations 13,650 and 13,590 on Bench 11, 12,990 and 12,850 on Bench 13, and 12,550 on Bench 14. The four (4) boulder clusters were installed in the river channel at river stations 13,050, 12,950, 12,825 and 12,400.

Fourteen (14) instream habitat structures were installed in Phase 3b, Reach 4 west bank in 2012: six (6) root wads embedded in created instream benches, two (2) low profile log instream structures, and five (5) instream boulder clusters, and one (1) boulder field. The six (6) root wads, which have the trunk embedded in the bank and the root wad in the channel, were installed on the right (west) bank at river stations 16,050 on Bench 6, 15,250 on Bench 8, 14,060 on Bench 9, 13,670 on Bench 10, 13,500 on Bench 10, and 13,290 on Bench 12. The two (2) low profile logs, which have the root wad embedded in the bank and the canopy in the channel, were installed on the right (west) bank at river stations 15,925 on Bench 6, and 13,210 on Bench 12. Five (5) boulder clusters were installed in the river channel at river stations 15,910, 15,790, 15,275, 13,280, and 13,190.

A planned grade control structure was replaced with the installation of a boulder field in the low-flow channel starting at upstream river station 13,980, between floodplain Benches 9 and 10 upstream of the confluence with the return drainage on the east bank. The design plan was modified to accommodate site constraints and preservation of existing willows at the base of the channel bank.

Four (4) instream structures were installed at Bank Stabilization Area 1 at Foley Johnson (Previously Sawyer): three (3) boulder clusters at stations 7,530, 7,460 and 7,410; and (1) root wad at station 7,512.

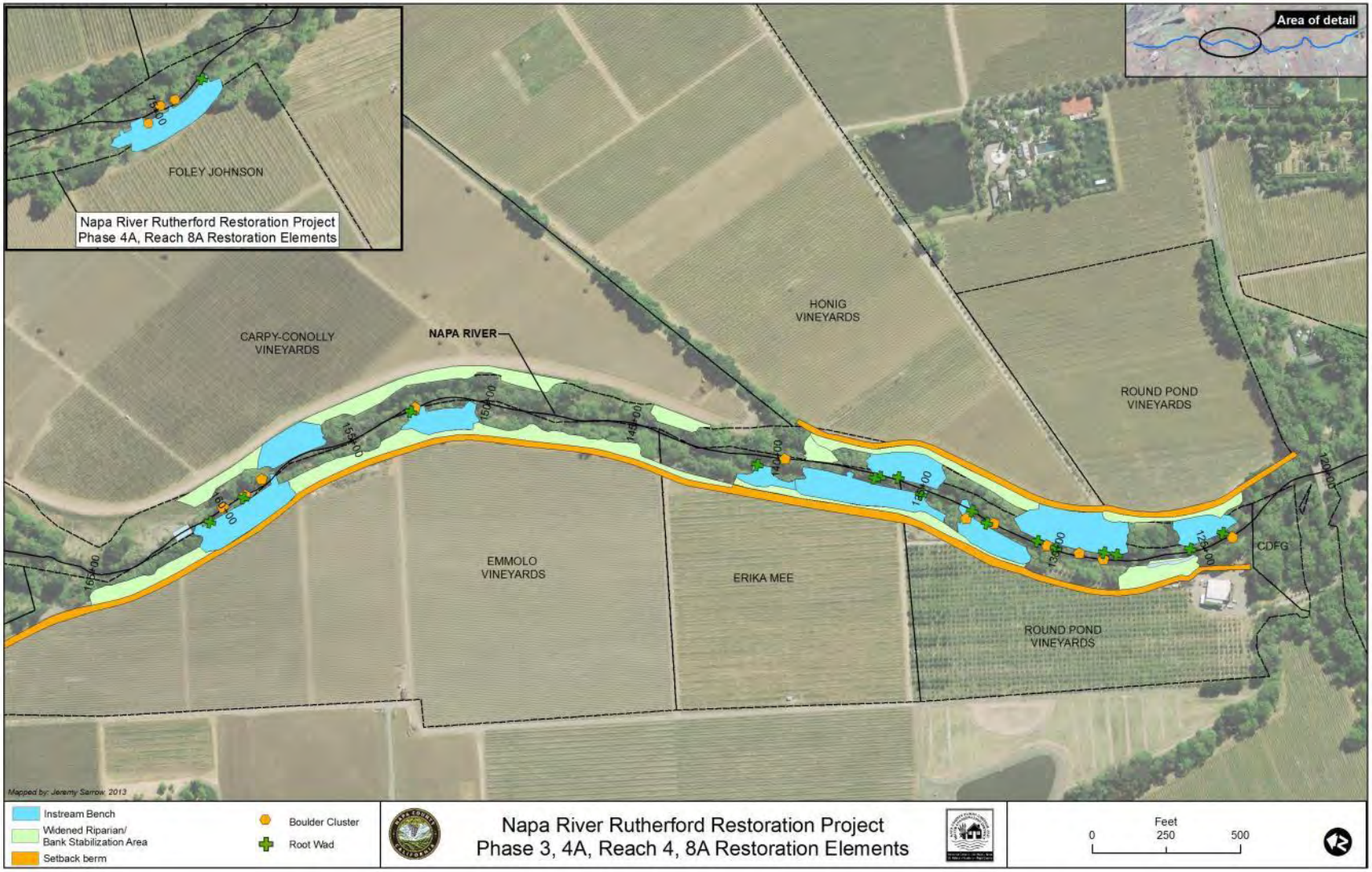

Figure 1. Phase 3, Reach 4 and Phase 4A, Reach 8A North (Foley Johnson) Constructed Restoration Elements

Table 3. Reach 4, 8A (Foley Johnson) Constructed Instream Habitat Feature Locations

River Station	Instream Habitat Feature	Bank	Associated Graded Feature	Parcel	Phase	Year Installed
16,050	Root Wad	Right / West	Bench 6	Emmolo	3b	2012
15,925	Low Profile Log	Right / West	Bench 6	Emmolo	3b	2012
15,910	Boulder	Right / West	Bench 6	Emmolo	3b	2012
15,790	Boulder Cluster	Right / West	Bench 6	Emmolo	3b	2012
15,275	Boulder Cluster	Right / West	Bench 8	Emmolo	3b	2012
15,250	Root Wad	Right / West	Bench 8	Emmolo	3b	2012
14,060	Root Wad	Right / West	Bench 9	Caymus (Mee)	3b	2012
13,980	Boulder Field	Mid	Benches 9 - 10	Caymus (Mee)	3b	2012
13,670	Root Wad	Right / West	Bench 10	Caymus (Mee)	3b	2012
13,650	Low Profile Log	Left / East	Bench 11	Honig	3a	2011
13,590	Low Profile Log	Left / East	Bench 11	Honig	3a	2011
13,500	Root Wad	Right / West	Bench 10	Caymus (Mee)	3b	2012
13,290	Root Wad	Right / West	Bench 12	Round Pond W	3b	2012
13,280	Boulder Cluster	Mid	Bench 12	Round Pond W	3b	2012
13,210	Low Profile Log	Right / West	Bench 12	Round Pond W	3b	2012
13,190	Boulder Cluster	Right / West	Bench 12	Round Pond W	3b	2012
13,070	Root Wad	Left / East	Bench 13	Honig	3a	2011
13,050	Boulder Cluster	Left / East	Bench 13	Honig	3a	2011
12,990	Low Profile Log	Left / East	Bench 13	Honig	3a	2011
12,950	Boulder Cluster	Mid	Bench 13	Honig	3a	2011
12,850	Low Profile Log	Left / East	Bench 13	Honig	3a	2011
12,825	Boulder Cluster	Mid	Bench 13	Honig	3a	2011
12,800	Root Wad	Left / East	Bench 13	Honig	3a	2011
12,550	Low Profile Log	Left / East	Bench 14	Round Pond E	3a	2011
12,420	Root Wad	Left / East	Bench 14	Round Pond E	3a	2011
12,400	Boulder Cluster	Left / East	Bench 14	Round Pond E	3a	2011

7,530	Boulder Cluster	Right / West	BSSR	Foley (Sawyer)	8a	2013
7,512	Root Wad	Right / West	BSSR	Foley (Sawyer)	8a	2013
7,460	Boulder Cluster	Right / West	BSSR	Foley (Sawyer)	8a	2013
7,410	Boulder Cluster	Right / West	BSSR	Foley (Sawyer)	8a	2013

Floodplain Excavation

Approximately 2,805 linear feet of stream bank were graded to create a series of nine (9) inset floodplain benches and 3 bank stabilization areas alternating along the east and west banks in project Reach 4. One bank stabilization area (right bank) spanning 323 linear feet between stations 7,625-7,300 was graded on the Foley Johnson property in Reach 8A. The floodplain benches are designed to reduce localized flow velocities and provide high flow refugia for salmonids over a range of high flow events. The benches were graded down to elevations ranging from 3 to 6 feet above the existing channel elevation to scour fine sediment from spawning gravel, promote gravel deposition. A 3:1 slope was graded between the floodplain bench and the top of bank to increase bank stability, and reduce erosion rates, and provide suitable surfaces for riparian revegetation.

Levee Setbacks

Approximately 8,665 linear feet of existing levees were removed and/or breached, and new, set back, engineered levees were constructed to replace them along the both the east and west banks of the river. The levees are approximately 5 feet high with a 15-foot crest, and were constructed with a 2:1 (river side) and 8:1 (land side) re-plantable side slopes on preexisting vineyards. Approximately 1,000 feet of the setback levee on the downstream end of the west bank was constructed with a 4:1 side slope along an olive orchard. A retaining wall was constructed at the downstream most end of the western levee in lieu of a 4:1 side slope to accommodate vehicle passage around existing building infrastructure A two stage levee was incorporated into the northern section of the Round pond property on the west bank to replace a pre-existing compost pad at the north end of the olive tree orchard. . The levee was setback an average of 50 feet from the river channel to create a larger vegetated buffer between the river and the adjacent vineyards and orchard, and to reduce the need to periodically repair the bank to protect adjacent property.

Invasive Species Removal and Management

Napa County actively manages invasive plant species in the Project reach as part of the Napa River Rutherford Reach Channel Maintenance Program, which is funded from the Three year contractor maintenance contract and the Maintenance Assessment District. Each year in June, a survey team led by Napa County staff, maps invasive plant species along the channel to develop the annual invasive vegetation management work plan for the Project. Invasive species managed include, but are not limited to, giant reed (*Arundo donax*), poison hemlock (*Conium maculatum*), Himalayan blackberry (*Rubus discolor*), periwinkle (*Vinca major*) and Red sesbania (*Sesbania*

punicea). Invasive vegetation outside the graded areas are also managed to remove invasive and non-native Pierce's disease host plants. Following treatment, these areas are planted with appropriate native over story and understory plants.

Erosion Control BMPs

Erosion control measures were installed in all graded and disturbed areas. These measures were installed in accordance with the previously submitted and approved Stormwater Pollution Prevention Plan (SWPPP). Items installed included the placement of erosion control fabric to protect the newly graded slopes. Straw wattles were also installed on the slopes and to all disturbed areas to protect against the formation of concentrated flows. Hydroseed was applied to the project site to promote vegetative growth and further stabilize the area to reduce erosion and input of fine sediments into the river. Wood mulch, which was recycled on site, was also utilized for erosion control. Once all measures were installed the County filed a Notice of Termination (NOT) with the state water board. These NOTs were filed for both East and West Bank construction in December 2011 and March 2013, respectively. Both NOTs are still pending.

Riparian Revegetation

Newly created floodplain benches and setback levee slopes were hydro-seeded immediately following grading consistent with SWPPP requirements. Native restoration planting with under and over story species began in mid-November but was temporarily delayed for approximately 2-3 months following high river flows in late November and December which precluded plant installation at lower elevations. Plant installation resumed in late January 2013 and was completed by March 2013. Additionally, localized areas which suffered minor stream bank erosion associated with the high river flows from November and December were subsequently re-stabilized utilizing bio-engineered techniques and re-planted during the month of March.

2.7 Construction Monitoring

Pre-Construction surveys were performed for Phase 3, 4A, Reaches 4 and 8A in accordance with the project permits. See Appendix D for the Construction Monitoring and Fish Relocation Activities Reports.

2.8 Longterm Maintenance and Monitoring

Following an adaptive management approach, Phase 3, Reach 4 implementation includes landowner and Napa County commitment to a detailed maintenance and monitoring program. Long-term monitoring of ecological evaluation criteria established in the PAEP will track project success and ensure adaptive management of riparian and aquatic habitat enhancements while TMDL implementation monitoring will concurrently track water quality benefits. The results of monitoring will be reported annually according to the Long Term Monitoring Plan. Maintenance will be recommended to resources agencies in an annual maintenance work plan.

2.9 As-Built Drawings

As-Built drawings for Phase 3, Reach 4 and Phase 4A, Reach 8A (Foley Johnson), of the Project are included on the Compact Disc (CD) enclosed as Appendix A to this Project Certification.

2.10 Natural Resource Projects Inventory

The Natural Resource Projects Inventory (NRPI) project survey form was completed. It can be viewed at the following link: http://www.ice.ucdavis.edu/nrpi/project.asp?ProjectPK=12386

2.12 Annual Nonpoint Source Pollution Reduction Project Follow-up Survey Form

Annual Nonpoint Source Pollution Reduction Project Follow-up Forms were submitted by the December due date each year following construction. The form for Phase 3A, Reach 4 was submitted in December 2011, and the form for Phase 3B, Reach 4 West was submitted in December 2012. Copies of the submitted forms are included in Appendix B.

2.11 Photo Documentation of Constructed Features

Pre- and Post-Construction photos are included in Appendix C.

2.13 Project Performance

The Project Assessment and Evaluation Plan (PAEP) set forth the project goals and desired outcomes of the Project in the following 4 categories:

I. Planning, Research, Monitoring and Assessment
II. Pollutant Load Reduction
III. Habitat Restoration
IV. Education, Outreach, and Capacity–Building

Performance results for the Rutherford Project as it pertains to these goals including the PAEP stated desired outcomes and targets is summarized in Tables 5-9.

Table 4. Planning, Research, Monitoring and Assessment Project Performance Measures

Napa River Rutherford Reach Restoration Project
Performance as of May 2014

Project Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets	Target Met? (Results)
Establish a community-based adaptive management, maintenance and monitoring program for the RDRT reach of the Napa River.	Landowner adoption and implementation of a long term maintenance and monitoring program.	Generation of a community-based maintenance and monitoring document in coordination with the technical advisory committee. Number of landowners participating in adaptive riparian monitoring and management	Implementation of agreed-upon maintenance recommendations required for project success.	Community-based outreach and planning. FISRWP 1998.	Establish and maintain a minimum three person Landowner Advisory Committee (LAC) to oversee annual maintenance and monitoring. Maintain existing level of greater than 90% landowner participation in ongoing adaptive management.	Yes, LAC is established and active. Yes, 100% of Reach 4 and 8A landowners participating in ongoing maintenance program.

Table 5. Pollutant Load Reduction Project Performance Measures

Napa River Rutherford Reach Restoration Project
Performance as of May 2014

Project Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets	Target Met? (Results)
Reduce channel bank erosion contributing fine sediment to the Napa River.	Stabilize actively eroding stream banks to reduce rates of bank erosion contributing fine sediment to the Napa River. Decrease the total length of eroding streambanks in the project reach. Stabilize channel incision to reduce rates of erosion contributing fine sediment to the Napa River. Minimize the need for ongoing channel stabilization and maintenance work.	Linear feet of bank treated.	Reduced length of actively eroding streambanks.	Channel surveys of eroding bank length. Surveys of channel geometry.	Reduce length of actively eroding stream banks throughout the Rutherford Reach (versus 2005 baseline survey) by 75%.	Through 2013 a 74% reduction in the length of eroding banks in the entire Rutherford Reach has been measured. The total goal is to be met through completion of future phases of construction. In Phase 3, Reach 4, 2,805 linear feet of the 8,000 linear feet of streambank, or 35% of the streambank length was treated, to reduce erosion. In Phase 4A, Reach 8A north on the Foley Johnson property, 325 linear feet of eroding streambank was treated.

Table 6. Aquatic Habitat Restoration Project Performance Measures

Napa River Rutherford Reach Restoration Project
Performance as of May 2013

Project Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets	Target Met? (Results)
Improve the quality and quantity of aquatic habitat within the Rutherford Reach for native aquatic species, including steelhead trout, Chinook salmon, California freshwater shrimp.	Improve riffle habitat quality. Increase quantity of riffle habitat available for spawning. Increase average pool depth for juvenile rearing. Create high-flow refugia to increase winter rearing value. Increase instream cover to reduce predation.	Quality of spawning gravel. Number and total length of instream habitat enhancement structures installed in the project reach. Linear feet of high-flow refugia created in the project reach. Number of pieces of large woody debris installed in the project reach.	Increased quality of spawning sized gravels, as indicated by increased median grain size (D50), reduced % finer than 2 mm. Increased riffle habitat length and/or frequency. Increased bank length offering high-flow refugia. Increased large woody debris density (# pieces/mile) providing increased stream cover.	Pebble counts. Stream inventory mapping of riffle length and/or frequency. Stream inventory mapping of large woody debris. Stream inventory mapping of instream structures. Surveys of channel geometry.	Statistically significant increase in riffle median grain size (D50). 30% increase in riffle length, or in riffle frequency, available for spawning in representative treated locations. Creation of 9 high-flow refugia in treated reach. 75% persistence of installed instream habitat enhancement structures.	The monitoring program is measuring long term increases in riffle median grain size (D50), and riffle length, or riffle frequency in the entire Rutherford Reach . Following construction of Phase 3a, Reach 4 east bank, and a peak flow of 2,050 cfs in 2012, one additional riffle crest formed in Reach 4 at new Honig Bench 13 near installed boulder clusters. Despite the drought year, The 9 riffle crests in Reach 4 were more evenly distributed along the reach compared to the 8 riffle crests the in 2011. 9 instream floodplain benches were built in Phase 3, 4A, Reach 4 and 8A creating 5.6 acres of high flow refugia for salmonids. 2011-2013: 100% of the installed instream habitat enhancement structures persisted.

Table 7. Riparian and Floodplain Habitat Restoration Project Performance Measures

Napa River Rutherford Reach Restoration Project
Performance as of May 2013

Project Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets	Target Met? (Results)
Improve riparian habitat quantity and quality within the Rutherford Reach.	Protect existing high value riparian corridor habitat where possible. Increase and enhance riparian and floodplain habitat value and complexity, with the aim of improving bird and wildlife diversity. Reestablish geomorphic and hydrologic processes to support a self-sustaining, continuous, and diverse native riparian corridor. Remove invasive non-native vegetation and replant with native vegetation. Increase diversity of native plant species.	Linear feet and area of non-native invasive weeds removed. Number of linear feet and total area of native riparian vegetation established, including planting density, when applicable. Diversity of riparian species planted. Reduced relative abundance of exotic plants	Increased linear and areal extent of riparian habitat cover. Increased ratio of area native cover versus area non-native cover. Increase in riparian species diversity. Re-establishment of native riparian vegetation	List of planted species. Field surveys, air photo analysis. Plant Surveys.	10.2 acres of native riparian cover. 75% survival of native plants planted in treated areas.	Approximately 9.86 acres on native riparian trees, shrubs, and grasses have been installed in Reach 4; or 97% of the target (Differences in acreage are in the margin of error due to aerial photo mapping techniques) 2013 vegetation survivorship surveys for Reach 4 were approximately 86% of planted material and 91% for the 8A Foley Johnson area.

Table 8. Education, Outreach, and Capacity-Building Project Performance Measures

Napa River Rutherford Reach Restoration Project
Phase 2 – Reach 3
Performance as of June 2011

Project Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets	Target Met? (Results)
Work closely with stakeholders and landowners to address their interests with regard to adjacent farmland and property in planning and implementing a restoration, monitoring, and maintenance plan for the Project reach.	Stakeholder interests represented in the peer-reviewed restoration, monitoring, and maintenance plan.	Stakeholder workshops. Signed landowner agreements.	Increase in general knowledge of stream stewardship for improving habitat and attenuating flood damage. Stakeholder consensus on the restoration, monitoring, and maintenanc e plan for the Project reach	Workshop agendas and minutes. Opinion/Behavior surveys.	Maintain existing level of greater than 90% landowner participation in ongoing adaptive management. Successful construction of the restoration design and implementation of the maintenance and monitoring plan.	Target met through the establishment of ongoing maintenance program funded through landowner assessments. Target met through completion of construction of Phase 3 and 4A, Reach 4 and 8A and the development and approval of the Project Monitoring Plan by the resource agencies.

2.14 Planning, Research, Monitoring and Assessment

This goal involved development of a rehabilitation plan for the River in a way that facilitates agency approval and established a community-based adaptive management, maintenance and monitoring program. The Phase 3, Reach 4 and Phase 4A, Reach 8A project design was fully permitted by the resource agencies, and a Landowner Advisory Committee (LAC) was created and is being maintained with quarterly meetings and newsletters to guide the longterm maintenance of the restored areas. There was 100% landowner participation in Phase 3, Reach 4 and Phase 4A, Reach 8A construction and ongoing adaptive management: Emmolo, Caymus (Previously Mee), Round Pond, Carpy-Conolly, Honig, and Foley Johnson properties.

2.15 Pollutant Load Reduction

A primary goal of the Project was to stabilize the rate of channel incision and reduce the length of eroding channel banks to reduce excessive fine sediment delivery to the mainstem Napa River that impairs salmonid spawning habitat. Another goal was to minimize the need for ongoing channel stabilization and maintenance work.

The TMDL target reduction in fine sediment delivery from Napa River mainstem channel incision is 19,000 metric tons per year. To measure fine sediment source reduction as result of each phase of Project implementation, the one-time removal of sediment available for delivery to the channel is measured and amortized over the life of the project (20 years). This amount is then added to an estimated average reduction in moderate bank erosion rates of 750 metric tons/mile/year thereafter as a result of stabilizing the channel and reducing the lateral recession rate of the channel banks.

The estimated total annual reduction in fine sediment delivery to the channel stemming from implementation of Phase 3, Reach 4 and Reach 4a at Foley Johnson from 2011-to 2013 is 3,740 metric tons per year for 20 years. (Phase 3a, Reach 4 East: 1,593 metric tons/year (2011), Phase 3b, Reach 4 West: 1,985 metric tons/year (2012), Phase 4a at Foley Johnson 162 metric tons/year (2012-2013). This rate includes the one time removal of 74,799 metric tons (61,146 cubic yards) from grading over steepened channel banks, added to a reduction in bank erosion rate of 750 metric tons/mile/year, over 0.82 miles of channel and a 20 year timeframe. This reduction constitutes 23% of the total TMDL target for the Napa River watershed from mainstem channel sources.

Completion of the first four Phases of restoration construction from 2009-2013 (Reaches 1 through 4 combined) made a one-time removal of 231,417 metric tons of fine sediment from the system from grading of eroding banks (Assuming soil bulk density of 1.6 metric tons per cubic meter). Including an estimated average reduction in bank erosion rates of 750 metric tons/mile/year thereafter, over 20 years, implementation of Phases 1-4, covering 3.4 miles in Reaches 1-4 and Reach 8 combined, will reduce sediment loading by 14,118 metric tons/year,

which is equivalent to 74% of the total target sediment reduction for the Napa River watershed from channel sources. See Appendix B for the Annual Non-Point Source Pollution Reduction Report.

Post-construction surveys of channel geometry were conducted in fall 2013. Napa County will utilize this data to conduct the LOMR model of post-construction hydraulics. Per the Monitoring Plan for the Rutherford Reach, cross section surveys will be re-occupied within 5 years or after a channel forming flow event to evaluate whether restored areas have performed to reduce erosion and channel incision.

2.16 Habitat Restoration

This goal focused on both aquatic and floodplain habitat restoration by increasing both the quality and quantity of aquatic habitat within the Rutherford Reach. Aquatic habitat was enhanced for native aquatic species, including steelhead trout, Chinook salmon, California freshwater shrimp. Management actions were designed to reestablish geomorphic and hydrologic processes to support a self-sustaining, continuous, and diverse native riparian corridor, decrease invasive weeds and increase diversity of native plant species.

The approved monitoring plan developed as part of the Project includes methodology to evaluate the long term effects of the Project actions. As part of Phase 3 and Phase 4A, Reach 4 and 8A (Foley Johnson), construction short term habitat goals have been met through construction of 9 high flow refugia benches. In the 2011-2012 winter season subsequent to construction, high flow velocity monitoring conducted by the Napa County Resource Conservation District (RCD) staff in demonstrated that the benches constructed on the east bank all inundated at the design flow events, and flow velocity targets for steelhead rearing habitat were being achieved. High flow velocity monitoring of benches constructed on the west bank was not conducted by the Napa County Resource Conservation District (RCD) in 2012-2013 because two storm flow events in December 2012 were too large to allow for safe surveying. Drought conditions then persisted for the three remaining months of winter.

All constructed instream habitat structures persisted. The RCD monitored the performance of the instream habitat structures on the Reach 4 and 8A during low flows in spring 2012, 2013 and 2014. The monitoring results are reported separately in the Annual Napa River Rutherford Reach Restoration Project Monitoring Report.

During Phase 3 and 4A, Reach 4 and 8A (Foley Johnson), 10.2 acres of native riparian cover were planted in graded areas. Irrigation systems have been installed for use in the summer months. Plant establishment and maintenance for all plants in Phase 3and 4A will continue under the supervision by the County to ensure a minimum of 80% survival rate by the end of a three-year establishment period. Thereafter, plantings will be maintained under the channel Maintenance Assessment District funded by the landowners and managed by the Napa County

Flood Control and Water Conservation District.

2.17 Education, Outreach and Capacity-Building

Napa County has established a relationship and is working closely with Rutherford Reach landowners to address their interests with regard to adjacent farmland and property and to share project goals and outcomes with public and other interested parties. The Project has been successfully implemented as designed. All landowners are participating in ongoing adaptive management and actively communicating with the County regarding maintenance needs.

The Rutherford Project has become an often cited example of an excellent public-private partnership. To that end, a significant amount of project outreach has been conducted to date, including: posters, oral presentations, slideshows, field trips, individual communication, newsletters, press releases, websites and database management.

Outreach to landowners involved in the Project includes: weekly construction meetings, quarterly Landowner Advisory Committee meetings, quarterly newsletters, frequent personal communication with the Landowner Liaison and the County Maintenance Representative and Project Director.

Outreach to the landowners within the greater Rutherford community included: presentations at the annual summer Rutherford Dust Society Block Party and winter Dinner.

Outreach to the overall Napa River Watershed community includes: conducting fieldtrips to view the project, participation in the Napa River Festival, Flyway Festival, teaming with outreach efforts by the Friends of the Napa River and the Napa County RCD, and sharing data with the Historical Ecology Atlas effort by the San Francisco Estuary Institute.

Outreach to the regulatory and grant funding agency community: monitoring program poster at the San Francisco Bay Estuary Conference, field tours, emails of project developments and incremental monitoring results, field trips, participation in the RWQCB Bay Area Watershed Network meetings, including monitoring, and policy subgroups—San Francisco Bay Joint Venture, North Bay Watershed Association, and Bay Area Watershed Network Monitoring Subgroup. Richard Thomasser has also presented at the 2013 Department of Water Resources Conference.

Outreach to the County TMDL compliance participants includes: Napa Technical Advisory Committee (TAC) meetings, Joint Project Team Meetings, and field trips.

Outreach to the general public: Facebook, RDS webpage, Napa County Watershed and Information Center and Conservancy (WICC) webpage, You Tube videos, Press Events and Releases by Napa County and the various funding agencies, Press Releases to the wine industry from the Rutherford Dust Society local landowner group, and updating online databases with environmental project data, including wetland tracker.

The California legislature also hosted an Assembly and Senate recognition event and reception, attended by Governor Jerry Brown, for the Project.

3. LESSONS LEARNED

3.1 Project Planning and Management

The success of this Project is dependent on effective landowner participation. Lessons learned in project planning included making sure there was frequent and clear communication. It was very effective to have weekly meetings and to take copious notes, which were reviewed at subsequent weekly meetings. It was very important to have the field construction contractor at these weekly meetings as well as the construction manager to make sure landowner concerns were addressed in a timely manner. Knowledge of landowner business practices and schedules was also important for ensuring a smooth construction operation, as was knowledge of landowner priorities regarding construction elements.

3.2 Project Implementation

Overall project success is also bolstered by the adaptive management program in place associated with an ongoing monitoring and maintenance plan. One of the issues associated with the large scale grading to create floodplain benches is that the exposed subsoil's are not equally conducive to erosion control grasses and plant growth. To ensure adequate plant survival, topsoil was harvested prior to grading, and the replaced topsoil was supplemented with compost made of the mulched removed vegetation.

Additionally, more robust, or higher, erosion control measures were required in promontories at the end of constructed instream benches to withstand the sheer force of high flows until the willow brush mattresses became established.

Lessons learned regarding native plant installations include having provisions in future re-vegetation contracts that include supplemental watering for irrigation from remote (trucked in) source should adjacent landowners not be able to provide needed water.

4. PLANNED PROJECT ACTIVITIES

4.1 Future Design and Construction Phases

As described above, the Rutherford Project is being constructed in five phases. To date 3/4 of the Rutherford Project has been constructed. As of 2013, restoration construction was completed in Reaches 1-4 between Zinfandel Lane and the Rutherford Cross Road, and well as in Reach 8 midway between the Rutherford and Oakville Cross Roads downstream. Napa County will construct the final phase of the Project, Reaches 5, 6, 7 and 9 in the summer of 2014. The goal is

to complete construction of the entire Rutherford Reach Project by 2017 to meet TMDL objectives.

4.2 Ongoing Project Monitoring and Maintenance

Project partners will continue annual monitoring and adaptive management to meet the performance measures set out in the PAEP and approved Project Monitoring Plan. Annual Monitoring and Maintenance reports will be submitted to resource agencies in accordance with the conditions of Project permits.

5. CONCLUSION

This concludes the Final Project Report for Phase 3, Reach 4A of the Rutherford reach Restoration Project.

6. GRANT RECIPIENT CONTACT

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Disclosure Statement

Funding for this project has been provided in part through an agreement with the State Water Resources Control Board. The contents of this document do not necessarily reflect the views and policies of the State Water Resources Control Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use. (Gov. Code § 7550, 40 CFR § 31.20).

APPENDIX A

AS-BUILT DRAWINGS

Enclosed Compact Disc.