

**Napa River Rutherford Reach Restoration Project  
Phase 2, Reach 3**

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**FINAL PROJECT REPORT**



**Napa County, California  
July 1, 2011**

**SWRCB Agreement No:** 08-609-552-0

**Total Project Cost:** \$1,705,882 (Final Design and Construction of Phase 2 – Reach 3)

**Funding Sources:**

**Federal Clean Water Act Section 319(h) Grant:** \$715,000

**Napa County Measure A Sales Tax:** \$990,882

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**County of Napa**  
**Napa River Rutherford Reach Restoration Project**  
**Phase 2 - Reach 3**  
**SWRCB Agreement No. 08-609-552-0**

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## **1. PROJECT SUMMARY**

### **1.1 Project Location and Background**

The Project site is located in Napa County, California, just south of the City of St. Helena, and is comprised of a 4.5-mile reach of the Napa River known as the Rutherford Reach. The Rutherford Reach extends south from Zinfandel Lane to Oakville Cross Road. The Rutherford Reach is subdivided into nine subreaches based on differences in channel morphology and restoration needs, and 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 Rutherford Cross Road and Oakville Cross Road. Preliminary engineering and revegetation plans have been prepared for the entire Rutherford Reach, and the Project is being constructed in phases. This Project Report addresses final design and construction of Phase 2 of the Project in Reach 3, which was completed in 2010 and funded by a Federal Clean Water Act Section 319(h) grant from the State of California Water Resources Control Board (SWRCB) matched with Napa County Measure A funds. Final design and construction of the remaining 6 reaches of the Project is ongoing and being funded by other grant programs.

### **1.2 Purpose and Objectives**

The objectives established by the landowner-based Rutherford Dust Restoration Team (RDRT) for restoration of the Rutherford Reach of the Napa River (Project) are to address the Total Maximum Daily Load (TMDL)-identified problems of sedimentation by working collaboratively with neighbors and agencies to stabilize 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, riparian revegetation and associated irrigation systems; bank stabilization measures; instream habitat enhancement structures; and enhancement of off-channel habitats. 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 channel and riparian habitat will improve due to decreased sedimentation and increased channel stability that will in turn increase 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 during events. These berms, however, do not represent a continuous (reach-wide) flood protection system.

### **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 populations are impaired by 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 settleable 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 California Environmental Quality Act (CEQA) review was completed through a Initial Study Mitigated Negative Declaration (IS/MND) that was completed by the County in 2008. A Project Assessment and Evaluation Plan (PAEP) (Jones and Stokes, 2008) was prepared that relates to Phase 2 of the overall restoration plan for the Rutherford Reach of the Napa River and addresses implementation of the restoration project in Reach 3.

The goal of this Project is to incorporate channel hydromodification, 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), including Section 7 Consultations/Biological Opinions by U.S. Fish and Wildlife and National Marine Fisheries Service. Remaining permits are issued by implementation phase. The State of California Regional Water Quality Control Board issued a 401 Water Quality Certification, and Department of Fish and Game issued a 1601 Streambed Alteration Permit specific to Phase 2, Reach 3 of the Project in 2010 prior to construction.

## 2. PHASE 2, REACH 3 MANAGEMENT AND MONITORING ACTIVITIES

### 2.1 Location

Phase 2, Reach 3 begins at the downstream end of Phase 1, Reaches 1 and 2, which was constructed in 2009-2010 (Final Report, dated May 30, 2011). Phase 1 extends from Zinfandel Lane, which is located approximately 2 miles southeast of St. Helena, downstream 6,257 feet (1.2 miles) between Project river stations 24,857 - 18,600. Phase 2, Reach 3 continues 2,600 feet (0.5 miles) downstream between project river stations 18,600 - 16,000 on the Caymus property on the right (west) bank, and the Carpy-Conolly property on the left (east) bank. Phase 2 spans an additional 2,000 feet along the top of the left (east) bank where the levee was setback on the Carpy-Conolly property, between river stations 16,000-14,000.

### 2.1 Funding

Phase 2, Reach 3 implementation was funded by the State Water Resources Control Board Section 319(h) grant program, matched with Measure A funds provided by Napa County. Ongoing project monitoring and maintenance is funded through a reach-wide parcel assessment by landowners in the Rutherford Reach. Phase 2 restoration cost \$185 per linear foot of restored channel (4,000 feet: 2,000 feet in channel + 2,000 additional linear feet along the top of the east (left) bank in Reach 4 East bank). Ongoing project monitoring and maintenance is funded through a reach-wide parcel assessment by landowners in the Rutherford Reach.

**Table 1. Funding Summary**

<b>SWRCB Agreement No. 08-609-552-0</b>	Federal Clean Water Act Section 319(h) Grant	\$715,000
<b>Napa County</b>	Measure A Flood Protection and Watershed Improvement Sales Tax Funds	\$990,882
<b>TOTAL FUNDING</b>		<b>\$1,705,882</b>

**Table 2. Cost Summary**

Project Activity	Total Costs	Funding Source	
		319(h) Grant	County Measure A
<b>Final Design</b>			
Professional Services	\$624,180	\$280,000	\$344,180
County Labor and Related Coordination	\$69,544	\$0.00	\$69,544
<b>Construction</b>			
Construction	\$1,102,158	\$435,000	\$577,158
<b>TOTAL PROJECT</b>	<b>\$1,705,882</b>	<b>\$715,000</b>	<b>\$990,882</b>

### 2.2 Design

Phase 2, Reach 3 final design was completed by ESA PWA (formerly Phillip Williams Associates) based upon the preliminary design completed by ICF Jones & Stokes, with design sub-consultation by Restoration Resources and Cramer Fish Sciences.

### **2.3 Construction Implementation**

Phase 2: Reach 3 took place in the summer of 2010, starting on June 1st. The construction contractor was Team Ghilotti, Inc., with subcontractors, Atlas Tree Service and Prunuske Chatham. The revegetation contractor was SMP Services.

Throughout the construction season weekly meetings were conducted to facilitate communication between the property owners, contractor, and County throughout Project implementation. Updated schedules were provided to track project status and to plan around agricultural operations. Minutes were taken for each meeting and were distributed to each representative involved in the project. A project walk-through was performed after each meeting to review project status and clarify any questions that may have arisen during construction.

Construction for the Phase 2, Reach 3 was completed on Month Day, 2010. All disturbed areas were stabilized with erosion control measures implemented in addition to Stormwater Pollution Prevention Plan (SWPPP) requirements.

### **2.4 Restoration Elements Installed**

Phase 2 Reach 3 construction included wholesale setback of the levee along the left (east) bank of the river to stabilize and reduce sediment loads into the river and widen the riparian corridor; excavation of five (5) instream floodplain benches to widen the overall functional width of the river and create slow water habitat for salmonids; installation of five (5) instream Large Woody Debris (LWD) root wads trenched into constructed benches to provide additional refugia for native migrating fish; and installation of a buried grade control structure to prevent further incision of the river channel and protect installed restoration features upstream. The 5.04 acres of graded area on the benches were replanted with native riparian vegetation and erosion control seeding. An additional 8.7 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 2, Reach 3, 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.

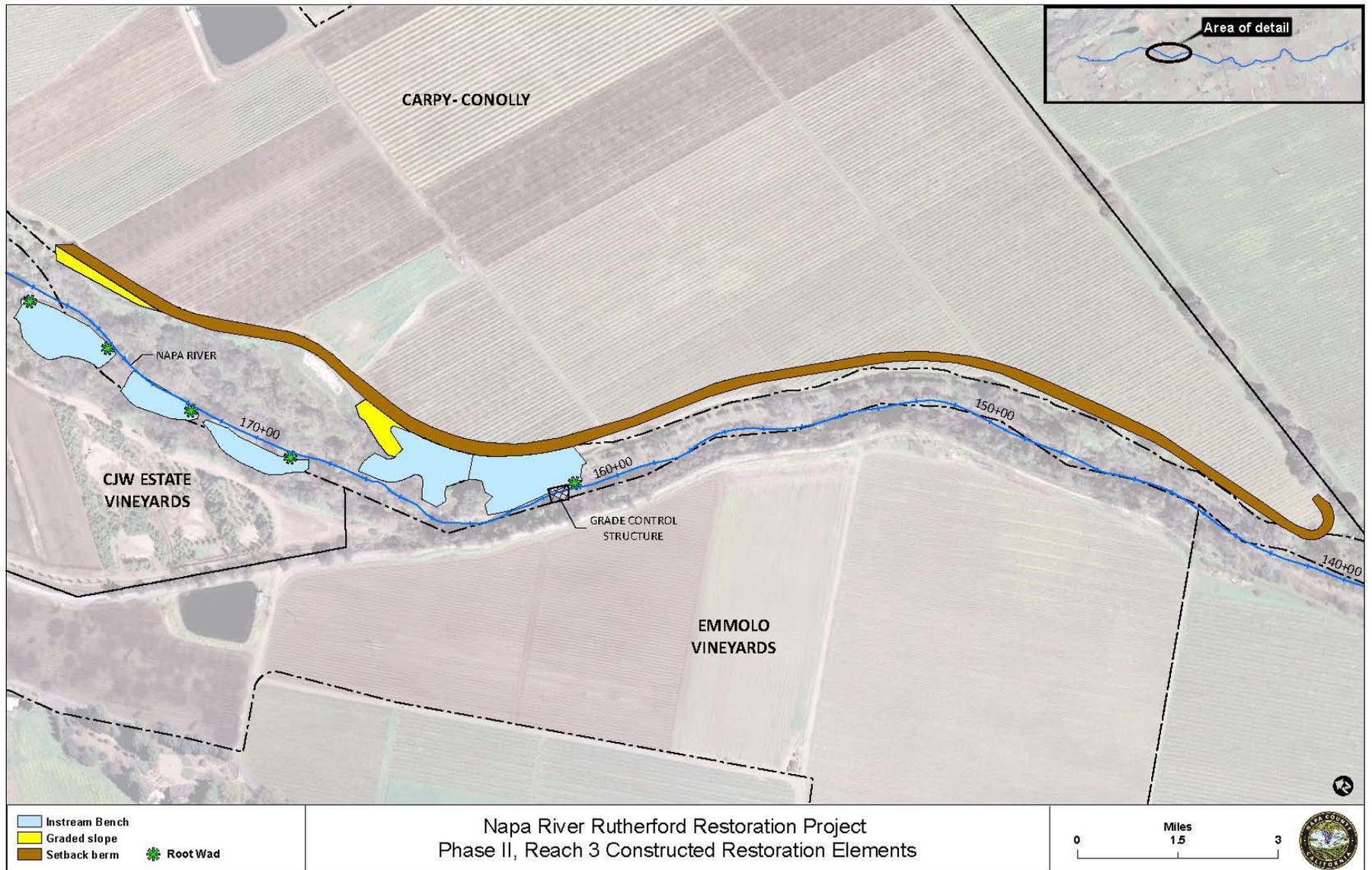


Figure 1. Phase 2, Reach 3 Constructed Restoration Elements

**Table 3. Constructed Restoration Feature Summary**

**Graded River Restoration Elements**

Instream Benches	5
Graded Banks	1,265 Linear Feet
Setback Berm	4600 Linear Feet

**Instream Habitat Structures**

LWD Root Wads Trenched into Instream Benches	5
Buried Grade Control Structure	1

**Riparian Habitat Restoration**

Restored Riparian Habitat	5.04 Acres
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**Table 4. Constructed Restoration Feature Locations**

2010	Phase 2	Reaches 1-3	PWA	18,600	16,000				
2010	Root Wad	Caymus	Right / West	17,700		WD-17700-R	Caymus Bench 1 US	17,700	17,425
2010	Root Wad	Caymus	Right / West	17,425		WD-17425-R	Caymus Bench 1 DS	17,700	17,425
2010	Secondary Channel	Caymus	Right / West	17,600			Caymus Bench 1	17,700	17,425
2010	Root Wad	Caymus	Right / West	17,175		WD-17175-R	Caymus Bench 2 DS	17,350	17,160
2010	Backwater Alcove	Caymus	Right / West	17,300			Caymus Bench 2	17,350	17,160
2010	Root Wad	Caymus	Right / West	16,900		WD-16900-R	Caymus Bench 3 DS	17,150	16,850
2010	Root Wad	Carpy-Conolly	Left / East	16,100		WD-16100-L	Carpy Conolly Bench 5 DS	16,350	16,100
2010	Buried Grade Control Structure	Carpy-Conolly				R-16165-MID	Carpy Conolly Bench 5	16,180	16,150

**Floodplain Excavation**

Approximately 1,265 linear feet of stream bank were graded to create a series of inset floodplain benches along the project reach. The benches were graded at an elevation consistent with the 1.5-year flood event to reduce localized flow velocities and provide a surface suitable for the establishment of riparian vegetation. 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 4,600 linear feet of existing levees were removed and/or breached, and new, set back, engineered levees were constructed to replace them along the left (east) bank 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) replantable side slopes. 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 to reduce the need to periodically repair the bank to protect adjacent property.

### ***Streambank Stabilization***

Native plants and erosion control seeding installed to stabilize banks and newly graded areas and reduce erosion and input of fine sediments into the river. The upper banks were planted with an appropriate mixture of native species to increase roughness and reduce flow velocities.

### ***Instream Habitat Enhancement***

A 30-foot long grade control structure was installed in the low-flow channel between river stations 16,180 - 16,150 to protect the bed from scour and incision. The design specified a 50-foot long structure, but site constraints, including difficulty dewatering the channel for installation, necessitated reducing the length of the structure by 20 feet.

### ***Invasive Species Removal and Riparian Revegetation***

Newly graded floodplain benches and setback levee slopes were planted with erosion control seeding, and native overstory and understory to reduce flow velocities, increase bank stability, provide new sources of large woody debris and refugia for native fish, and create habitat for riparian species. Chemical and/or mechanical treatment methods were used in vegetation management zones outside of the graded areas to remove invasive and non-native Pierce's disease host plants, such as arundo, vinca, and Himalayan blackberry. Following treatment, these areas are being planted with appropriate native overstory and understory (non-Pierce's disease host) plants under a separate contract funded by Napa County.

## **2.5 Phase 2, Reach 3 Construction Monitoring**

Pre-Construction surveys were performed in accordance with the project permits. Appendix E provides a summary of these surveys and also associated fish relocation activities.

## **2.6 Longterm Maintenance and Monitoring**

Following an adaptive management approach, Phase 2, Reach 3 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.

## **2.7 As-Built Drawings**

As-Built drawings for the completed Phase 2, Reach 2 portions of the Project are included on the Compact Disc (CD) enclosed as Appendix A to this Project Certification.

## **2.8 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>

## **2.9 Photo Documentation of Constructed Features**

Pre- and Post-Construction photos are included in Appendix B

## **2.10 Annual Nonpoint Source Pollution Reduction Project Follow-up Survey Form**

The Annual Nonpoint Source Pollution Reduction Project Follow-up Form was submitted on December 15, 2010. An updated copy of the submitted form is included in Appendix C.

## **2.11 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

The performance (results) to date for the completed Phase 2 Reach 3 portion of the overall Rutherford Project as it pertains to these goals including the PAEP stated desired outcomes and targets is summarized in Tables 5 through 9 and discussed below.

**Table 5. Planning, Research, Monitoring and Assessment 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)
<p>Establish a community-based adaptive management, maintenance and monitoring program for the RDRT reach of the Napa River.</p>	<p>Landowner adoption and implementation of a long term maintenance and monitoring program.</p>	<p>Generation of a community-based maintenance and monitoring document in coordination with the technical advisory committee.</p> <p>Number of landowners participating in adaptive riparian monitoring and management</p>	<p>Implementation of agreed-upon maintenance recommendations required for project success.</p>	<p>Community-based outreach and planning.</p> <p>FISRWP 1998.</p>	<p>Establish and maintain a minimum three person Landowner Advisory Committee (LAC) to oversee annual maintenance and monitoring.</p> <p>Maintain existing level of greater than 90% landowner participation in ongoing adaptive management.</p>	<p>Yes, LAC is established and active.</p> <p>Yes, 100% of reach 3 landowners participating in ongoing maintenance program.</p>

**Table 6. Pollutant Load Reduction 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)
<p>Reduce channel bank erosion contributing fine sediment to the Napa River.</p>	<p>Stabilize actively eroding stream banks to reduce rates of bank erosion contributing fine sediment to the Napa River.</p> <p>Decrease the total length of eroding streambanks in the project reach.</p> <p>Stabilize channel incision to reduce rates of erosion contributing fine sediment to the Napa River.</p> <p>Minimize the need for ongoing channel stabilization and maintenance work.</p>	<p>Linear feet of bank treated.</p>	<p>Reduced length of actively eroding streambanks.</p>	<p>Channel surveys of eroding bank length.</p> <p>Surveys of channel geometry.</p>	<p>Reduce length of actively eroding stream banks throughout the Rutherford Reach (versus 2005 baseline survey) by 75%.</p> <p>18,639 cubic yards of channel bank sediment source removed through grading.</p>	<p>Met over 100 % of original target (1,265 feet of graded streambank) as part of Phase 2 grading.</p> <p>Yes, this goal is being met through management actions and maintenance over time.</p> <p>To date a 44% 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.</p> <p>18,639 cubic yards sediment source removed through grading in Phase 2.</p>

**Table 7. Aquatic Habitat Restoration 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)
<p>Improve the quality and quantity of aquatic habitat within the Rutherford Reach for native aquatic species, including steelhead trout, Chinook salmon, California freshwater shrimp.</p>	<p>Improve riffle habitat quality.</p> <p>Increase quantity of riffle habitat available for spawning.</p> <p>Increase average pool depth for juvenile rearing.</p> <p>Create high-flow refugia to increase winter rearing value.</p> <p>Increase instream cover to reduce predation.</p>	<p>Quality of spawning gravel.</p> <p>Number and total length of instream habitat enhancement structures installed in the project reach.</p> <p>Linear feet of high-flow refugia created in the project reach.</p> <p>Number of pieces of large woody debris installed in the project reach.</p>	<p>Increased quality of spawning sized gravels, as indicated by increased median grain size (D50), reduced % finer than 2 mm.</p> <p>Increased riffle habitat length and/or frequency.</p> <p>Increased bank length offering high-flow refugia.</p> <p>Increased large woody debris density (# pieces/mile) providing increased stream cover.</p>	<p>Pebble counts.</p> <p>Stream inventory mapping of riffle length and/or frequency.</p> <p>Stream inventory mapping of large woody debris.</p> <p>Stream inventory mapping of instream structures.</p> <p>Surveys of channel geometry.</p>	<p>Statistically significant increase in riffle median grain size (D50).</p> <p>30% increase in riffle length, or in riffle frequency, available for spawning in representative treated locations.</p> <p>Creation of 5 high-flow refugia in treated reach.</p> <p>75% persistence of installed instream habitat enhancement structures.</p>	<p>In progress. Long term monitoring goal. Monitoring Plan is in place.</p> <p>In progress. Long term monitoring goal. Monitoring Plan is in place.</p> <p>5 high flow refugia benches have been created as part of Phase 2.</p> <p>To date 100% of the installed instream habitat enhancement structures have persisted.</p>

**Table 8. Riparian and Floodplain Habitat Restoration 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)
<p>Improve riparian habitat quantity and quality within the Rutherford Reach.</p>	<p>Protect existing high value riparian corridor habitat where possible.</p> <p>Increase and enhance riparian and floodplain habitat value and complexity, with the aim of improving bird and wildlife diversity.</p> <p>Reestablish geomorphic and hydrologic processes to support a self-sustaining, continuous, and diverse native riparian corridor.</p> <p>Remove invasive non-native vegetation and replant with native vegetation. Increase diversity of native plant species.</p>	<p>Linear feet and area of non-native invasive weeds removed.</p> <p>Number of linear feet and total area of native riparian vegetation established, including planting density, when applicable.</p> <p>Diversity of riparian species planted.</p> <p>Reduced relative abundance of exotic plants</p>	<p>Increased linear and areal extent of riparian habitat cover.</p> <p>Increased ratio of area native cover versus area non-native cover.</p> <p>Increase in riparian species diversity.</p> <p>Re-establishment of native riparian vegetation</p>	<p>List of planted species.</p> <p>Field surveys, air photo analysis.</p> <p>Plant Surveys.</p>	<p>5.04 acres of native riparian cover.</p> <p>75% survival of native plants planted in treated areas.</p>	<p>100% of original target (5.04 acres) of revegetation was performed as part of Phase 2.</p> <p>Enhancement of additional acreage is also occurring through long term maintenance activities.</p> <p>Target exceeded with over 90% survival of plantings to date.</p>

**Table 9. 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)
<p>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.</p>	<p>Stakeholder interests represented in the peer-reviewed restoration, monitoring, and maintenance plan.</p>	<p>Stakeholder workshops.  Signed landowner agreements.</p>	<p>Increase in general knowledge of stream stewardship for improving habitat and attenuating flood damage.  Stakeholder consensus on the restoration, monitoring, and maintenance plan for the Project reach</p>	<p>Workshop agendas and minutes.  Opinion/Behavior surveys.</p>	<p>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.</p>	<p>Target met through the establishment of ongoing maintenance program funded through landowner assessments.  Target met through completion of construction of Phase 2 – Reach 3 and the development and approval of the Project Monitoring Plan by the resource agencies.</p>

### 2.12 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 2, Reach 3 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 2, Reach 3 construction and ongoing adaptive management: Caymus and Carpy-Conolly properties.

### 2.13 Pollutant Load Reduction

This goal focused on reducing channel bank erosion contributing fine sediment to the River through decreasing the length of eroding stream banks in the project reach and stabilizing channel incision. It also included minimizing the need for ongoing channel stabilization and maintenance work and improving riffle habitat quality by reducing sediment impairment from eroding stream banks.

As of 2/13/2011													
Napa River Rutherford Reach Restoration Project	River Bank (Left or Right, East or West)	LOCATION			SEDIMENT SOURCE REMOVED- CUT/OFFHAUL					Metric Tons/Year (over 20 years) Reduced Sedimentation due to Cut from Channel Banks	Metric Tons/Mile/Year (over 20 years) Reduction in Yearly Bank Erosion Rates (Assuming 750 tons/mile/year)	TOTAL ANNUAL REDUCTION IN SEDIMENT DELIVERY TO THE CHANNEL (Metric tons/year)	RWQCB GRTS Reporting Year
		Phase Upstream Station	Phase Downstream Station	Drainage Area (square miles)	Linear Feet	Miles	Cubic Yards Cut from Channel Banks	Cubic Meters Cut from Channel Banks	Metric Tons Cut from Channel Banks (Bulk Density of 1.6 metric tons/cubic meter)				
<b>PHASE 1 - 2009-2010</b>		<b>24,857</b>	<b>18,600</b>	<b>83</b>	<b>6257</b>	<b>1.19</b>	<b>48,041</b>	<b>36,730</b>	<b>58,768</b>	<b>2,938</b>	<b>889</b>	<b>3,827</b>	<b>2009</b>
<b>Phase 1a - East Bank - 2009</b>		24,857	18,600	83	6257	1.19	16,801	12,845	20,552	1,028	889	1,916	2009
Guggenheim Bench Cut	East / Left												
Quintessa Bench Cut	East / Left												
Offhaul to Stockpile 16038 cubic yards													
Fill 763 cubic yards													
<b>Phase 1b - West Bank - 2010</b>		24,857	18,600	83	6257	1.19	31,240	23,885	38,216	1,911	889	2,800	2010
Existing Berm Cut	West / Right							2,703					
Alcove and Two Benches:	West / Right							28537					
Ranch Winery / Sutter Home Alcove													
Frog's Leap Bench Cut													
Caymus Bench Cut													
<b>Phase 2 (Per CAD Contours) - 2010</b>		<b>18,600</b>	<b>16,000</b>	<b>85</b>	<b>2600</b>	<b>0.49</b>	<b>18,639</b>	<b>14,251</b>	<b>22,801</b>	<b>1,140</b>	<b>369</b>	<b>1,509</b>	<b>2010</b>
Caymus Bench 1	West / Right							2726	2,084	3,335			
Caymus Bench 2	West / Right							749	573	916			
Caymus Bench 3	West / Right							1146	876	1,402			
Carpy-Conolly Bench 4	East / Left							6214	4,751	7,602			
Carpy-Conolly Bench 5	East / Left							6464	4,942	7,907			
Berm Removal 2300-400	East / Left							1180	902	1,443			
Berm Removal 3400-2800	East / Left							160	122	196			
<b>PHASES 1 - 2 - 2010</b>		<b>24,857</b>	<b>16,000</b>	<b>85</b>	<b>8857</b>	<b>1.68</b>	<b>66,680</b>	<b>50,981</b>	<b>81,569</b>	<b>4,078</b>	<b>1,258</b>	<b>5,337</b>	<b>2010</b>
<b>PHASE 3 - 2011-2012</b>		<b>16,000</b>	<b>12,000</b>	<b>86</b>	<b>4000</b>	<b>0.76</b>	<b>66,141</b>	<b>50,568</b>	<b>80,909</b>	<b>4,045</b>	<b>568</b>	<b>4,614</b>	<b>2012</b>
<b>Phase 3a - Estimated 2011-2012</b>		16,000	12,000	86	4000	0.76	36,781	28,121	44,994	2,250	568	2,818	2011
Carpy-Conolly Bench 7	East / Left							4780					
Carpy-Conolly Bank Stabilization	East / Left							740					
Honig Bank Stabilization	East / Left							350					
Honig Bench 11	East / Left							16640					
Honig Bench 13	East / Left							10703					
Round Pond East Bench 14	East / Left							3568					
<b>Phase 3b - 2012 Estimated</b>		16,000	12,000	86	4000	0.76	29,360	22,447	35,916	1,796	568	2,364	2012
Emmolo Bench 6	West / Right							5720					
Emmolo Bench 8	West / Right							5110					
Mee Bench 9	West / Right							1120					
Mee Bench 10	West / Right							10100					
Round Pond West Bench 12	West / Right							4660					
Round Pond West Bank Stabilization	West / Right							2650					
<b>PHASES 1-3 Estimated - 2012</b>		<b>24,857</b>	<b>12,000</b>	<b>86</b>	<b>12857</b>	<b>2.44</b>	<b>132,821</b>	<b>101,549</b>	<b>162,478</b>	<b>8,124</b>	<b>1,826</b>	<b>9,950</b>	<b>2012</b>

The TMDL target reduction in fine sediment delivery from Napa River mainstem channel incision is 19,000 metric tons per year. To measure the reduction in fine sediment source as result of the Project, the one-time removal of sediment available for delivery to the channel was caymused and amortized over the life of the project (20 years). Completion of the first two Phases of restoration construction in 2009 and 2010 (Reaches 1 through 3 combined) made a one-time removal of 81,569 metric tons (58,768+22,801 metric tons) (50,981 cubic meters) (66,680cubic yards) of fine sediment from the system from grading eroding banks (Assuming soil bulk density of 1.6 metric tons per cubic meter), and an estimated average reduction in bank erosion rates of 750 metric tons/mile/year thereafter. Over 20 years, implementation Phases 1-2

combined will reduce sediment loading by 4,078 metric tons/year, or 21% of the total target reduction for the Napa River watershed from channel incision sources. See Appendix C for the Annual Non-Point Source Pollution Reduction Report.

Post-construction surveys of channel geometry will be conducted within 5 years or after a channel forming flow event to evaluate whether restored areas have performed to reduce erosion and channel incision.

#### **2.14 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 2 construction short term habitat goals have been met through construction of 5 high flow refugia benches. In the 2010-2011 winter season subsequent to construction, high flow velocity monitoring conducted by the Napa County Resource Conservation District (RCD) staff in demonstrated that the benches all inundated at the design flow events, and flow velocity targets for steelhead rearing habitat were being achieved. All constructed instream habitat structures have persisted through the first winter season since they have been installed. The RCD monitored the performance of the instream habitat structures during a low flow in spring 2011, and the results have been reported separately and included as an appendix in the Annual Napa River Rutherford Reach Restoration Project Monitoring Report.

During Phase 2, Reach 3 5.04 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 2 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.

#### **2.15 Education, Outreach and Capacity-Building**

The 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 August 2010 Chili Ball (Block Party) and Annual Rutherford Dust Society (RDS) Dinner in February.

Outreach to the overall Napa River Watershed community includes: 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.

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 Releases to local press from the County, 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.

### **3. LESSONS LEARNED**

This section provides a discussion of lessons learned in carrying out the Project.

#### **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 subsoils 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 shear force of high flows until the willow brush mattresses became established.

## **4. PLANNED PROJECT ACTIVITIES**

### **4.1 Future Design and Construction Phases**

As described above, the Rutherford Project is being constructed in phases. Phase 1, Reaches 1 and 2, and Phase 2, Reach 3 was completed in 2010. Final Design for Phase 3, Reach 4, has been completed, which extends restoration to the halfway point of the Project at the Rutherford Cross Road. Construction of the east (left) bank will take place in summer 2011 on the Carpy-Conolly, Honig and Round Pond properties with funding from the EPA San Francisco Bay Water Quality Improvement Fund. Funding is pending from the SWRCB 319(h) non-point source grant program for construction of the west (right) bank of Reach 4 in summer 2012 on the Emmolo, Mee and Round Pond properties. A grant from the California Department of Parks and Recreation Habitat Conservation Fund will also fund riparian and aquatic habitat restoration on both banks of Reach 4. County Measure A is matching all of the Reach 4 grants.

The County has funded final design for Phase 4, Reach 8 and plans and specifications will be ready for construction in 2012-2013. At present no funding has been secured for construction of Reach 8, but a Habitat Conservation Fund (HCF) grant has been applied for to address a severely eroding bank at Sequoia Grove, and other grant and mitigation funding programs are being investigated.

A grant application has been submitted to the California Department of Fish and Game to fund the final design for the remaining reaches (5, 6, 7 and 9). 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 2 of the Rutherford reach Restoration Project. A completed Table of Items for review, which outline completion of all deliverables required as part of the grant funding is included as Appendix D.

### **6. GRANT RECIPIENT CONTACT**

For further information, please contact:

Richard Thomasser  
County of Napa  
(707) 259-8657  
[richard.thomasser@countyofnapa.org](mailto:richard.thomasser@countyofnapa.org)

#### **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**

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Compact Disc. Contact Napa county Flood control District for details.

**APPENDIX B**  
**PRE- AND POST-CONSTRUCTION PHOTOGRAPHS**

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# Napa River Rutherford Reach Restoration Project

Phase 2, Reach 3  
Photomonitoring  
Pre- and Post-Construction 2010-2011

# Napa River Rutherford Reach Restoration Project Phase 2, Reach 3 Photopoints



- ▲ Photo Point
- River Station
- Topographic Lines of Constructed Features

## RDRT Phase 2, Reach 3 Photomonitoring Locations

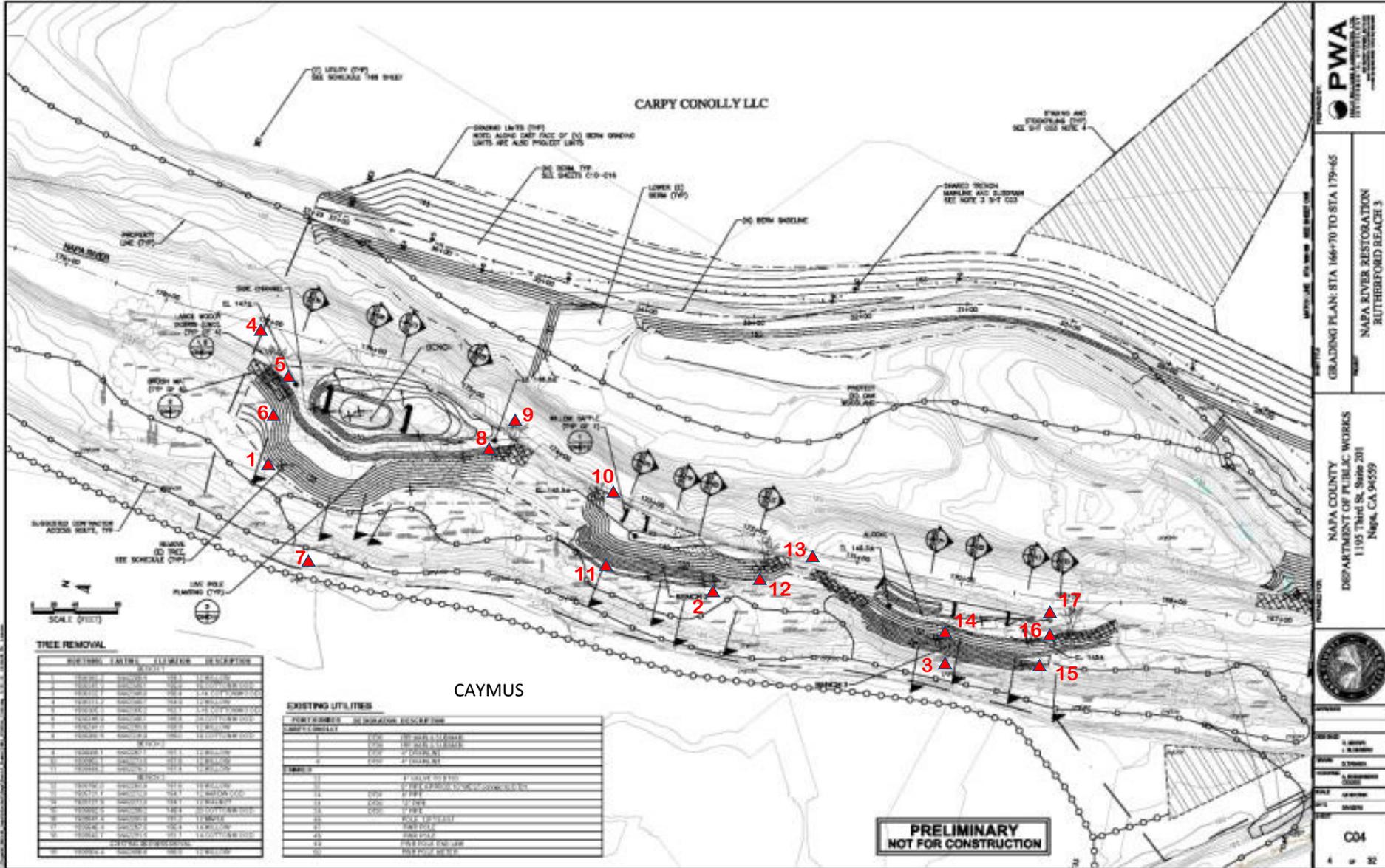
Map Created June 9, 2011



B-17560-R  
 "Bench 1 – Caymus"  
 Secondary Channel

B-17260-R  
 "Bench 2 – Caymus"  
 Edgewater

B-17000-R  
 "Bench 3 – Caymus"  
 Edgewater



**PWA**  
 PROFESSIONAL WATERWAY ASSOCIATION

**NAPA COUNTY**  
 DEPARTMENT OF PUBLIC WORKS  
 1105 Third St, Suite 201  
 Napa, CA 94559

GRADING PLAN: STA 166+70 TO STA 179+65  
 NAPA RIVER RESTORATION  
 BUTTERFORD BEACH 3

C04  
 4 of 22

Bench 1 with Secondary Channel: Reach 3: River Stations 17,425-17,700: Photo Point 1



Bench 2 with Backwater Alcove: Reach 3: River Stations 17,160-17,350: Photo Point 2



Bench 3 Refugia: Reach 3: River Stations 16,850-17,150: Photo Point 3



River Stations 17,700-17,425  
Right (West) Bank

Caymus Bench 1  
with Secondary Channel

# Station 17,700

Channel to Downstream: Photo Point 4

## Caymus Bench 1 Upstream End



# Station 17,660

Secondary Right (West) Bank Channel to Upstream: Photo Point 5

## Caymus Bench 1 Upstream, Root Wad



# Station 17,650

Right (West)Bank to Downstream: Photo Point 6

## Caymus Bench 1



October 19, 2010



December 29, 2010

# Station 17,625

Right (West) Bank Existing Berm to Channel: Photo Point 7

## Caymus Bench 1



April 14, 2010



January 1, 2011

# Station 17,450

Right (West) Bank Secondary Channel to Upstream: Photo Point 8

## Caymus Bench 1



June 3, 2010



May 2011

# Station 17,450

Right (West) Bank Secondary Channel to Upstream: Photo Point 8

## Caymus Bench 1



October 2010



May 2011

# Station 17,450

Channel to Upstream: Photo Point 9

## Caymus Bench 1



November 2010

River Stations 17,350-17,160  
Right (West) Bank

Caymus Bench 2  
with Backwater Alcove

# Station 17,350

Right (West)Bank Upstream: Photo Point 10

## Caymus Bench 2



November 2010

# Station 17,350

Right (West)Bank Downstream: Photo Point 10

## Caymus Bench 2



November 2010



May 2011

# Station 17,300

Right (West)Bank Upstream: Photo Point 11

## Caymus Bench 2



October 10, 2010



December 29, 2010

# Station 17,200

Right (West)Bank Upstream: Photo Point 2

## Caymus Bench 2



December 29, 2010



May 2011

# Station 17,160

Right (West)Bank Upstream: Photo Point 12

## Caymus Bench 2



November 2010



May 2011

River Stations 17,150-16,850  
Right (West) Bank

Caymus Bench 3  
with Edgewater

# Station 17,120

Channel to Downstream Right (West)Bank: Photo Point 13

## Caymus Bench 3



June 3, 2010



May 2011

# Station 17,000

Right (West)Bank to Channel: Photo Point 3

## Caymus Bench 3



November 2010



February 2011

## Station 16,990

Right (West)Bank to Existing Berm: Photo Point 14

### Caymus Bench 3



June 3, 2010

## Station 16,990

Right (West)Bank to Downstream: Photo Point 14

### Caymus Bench 3



June 3, 2010

## Station 17,000

Right (West)Bank to Channel: Photo Point 3

### Caymus Bench 3



February 2011

# Station 16,990

Right (West)Bank to Left (East) Bank: Photo Point 14

## Caymus Bench 3



April 2010



May 2011

# Station 16,900

Right (West)Bank to Upstream: Photo Point 15

## Caymus Bench 3



October 19, 2010



December 29, 2010

# Station 16,900

Right (West)Bank to Upstream: Photo Point 15

## Caymus Bench 3



December 29, 2010



May 2011

# Station 16,900

Right (West)Bank to Existing Berm: Photo Point 16

## Caymus Bench 3



April 2010



May 2011

# Station 16,900

Channel to Upstream Right (West)Bank: Photo Point 17

## Caymus Bench 3 Downstream End



June 3, 2010



May 2011

River Stations 17,700-14,000  
Left (East) Bank

Carpy-Conolly  
Benches and Setback Berm

# River Station 16,420

Left (East) Bank Top of Old Berm Looking Upstream: Photo Point 46  
Carpy-Conolly Bench 4, Setback Berm



April 16, 2010



January 27, 2011

# River Station 15,950

Left (East) Bank Top of New Berm Looking Upstream: Photo Point 44

## Carpy-Conolly Benches 5 and 4, Heritage Oak Tree Island, Setback Berm



April 16, 2010



January 27, 2011

# River Station 15,950

Left (East) Bank Base of New Berm Looking Towards Channel: Photo Point 44  
Setback Berm, Carpy-Conolly Bench 5, Heritage Oak Tree Island



April 16, 2010



January 27, 2011

## River Station 16,250

Left (East) Bank Top of New Berm Looking Towards Channel: (300 feet Upstream of Photo Point 44) Photo Point 60  
Setback Berm, Carpy-Conolly Bench 5, Heritage Oak Tree Island



April 16, 2010



January 27, 2011

# River Station 16,381

Left (East) Bank Top of Old Berm on Heritage Oak Tree Island Looking Downstream: Photo Point 49  
Carpy-Conolly Bench 5, Setback Berm



April 16, 2010



January 27, 2011

# River Station 15,100

Left (East) Bank Top of New Berm Looking Towards Channel: Photo Point 50  
Setback Berm



April 16, 2010



January 27, 2011

# River Station 14,700

Left (East) Bank Top of New Berm Looking Upstream: Photo Point 53  
Setback Berm, Expanded Riparian Buffer



April 16, 2010



February 4, 2011

**APPENDIX C**  
**ANNUAL NON-POINT SOURCE POLLUTION REDUCTION PROJECT**  
**FOLLOW-UP SURVEY FORM**

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## ***Annual Load Reduction Form***

### **State Water Resource Control Board**

**Division of Financial Assistance**

**1001 I Street, 16th Floor**

**Sacramento, CA 95814**

**319(h) Non Point Source Grants**

For more information contact: Jodi Ponteruri (916) 341-5306 [jpontureri@waterboards.ca.gov](mailto:jpontureri@waterboards.ca.gov)

### **Project Information**

<b>Project Title:</b>	<b>Napa River Rutherford Reach Restoration Project</b>
<b>Pin #:</b>	
<b>SB Project #:</b>	
<b>Contact Name:</b>	<b>Richard Thomasser, Napa County Flood Control and Water Conservation District</b>
<b>Contact Phone:</b>	<b>707-259-8657</b>
<b>Contact Email:</b>	<b><a href="mailto:Richard.Thomasser@CountyofNapa.org">Richard.Thomasser@CountyofNapa.org</a></b>
<b>Project start date:</b>	<b>6/1/2010</b>
<b>Project Completion date - m/yr:</b>	<b>11/2010 for Construction; 1/2011 for Revegetation</b>
<b>Extension Requested ?:</b>	
<b>Reason for Extension ?:</b>	
<b>Extension Approved ?:</b>	
<b>New Completion date - m/yr:</b>	
<b>No Load Reduction explanation:</b>	

Load Reductions for 2010						
<b>Drainage area (in square miles):</b>	<u>85</u>		<b>BMP Implemented:</b>	<u>Graded Chanel Banks</u>		<b>Y</b>
Sediment	If other please list: _____		<u>4,291</u>	Units*:	<u>tons per yr</u>	for 20 years
			Load Reduction			
Enter A Pollutant	If other please list: _____		<u>          </u>	Units*:	<u>Enter Units</u>	
			Load Reduction			
Enter A Pollutant	If other please list: _____		<u>          </u>	Units*:	<u>Enter Units</u>	
			Load Reduction			
<b>Drainage area (in square miles):</b>			<b>BMP Implemented:</b>			<b>TMDL?</b>
Enter A Pollutant	If other please list: _____		<u>          </u>	Units*:	<u>Enter Units</u>	
			Load Reduction			
Enter A Pollutant	If other please list: _____		<u>          </u>	Units*:	<u>Enter Units</u>	
			Load Reduction			
Enter A Pollutant	If other please list: _____		<u>          </u>	Units*:	<u>Enter Units</u>	
			Load Reduction			
* Must be reported in one of these available units						

- These figures have been updated since the original submission on December 2010.

Load Reductions from Newly Implemented BMPs - 2006 - 2009 Grants							
Napa River Rutherford Reach Phase 1b							
Drainage area (in square miles):	83			BMP Implemented:	Graded Chanel Banks		Y
Sediment	If other please list:		1,923	Units*:	tons per yr	for 20 years	
			Load Reduction				
Enter A Pollutant	If other please list:			Units*:	Enter Units		
			Load Reduction				
Enter A Pollutant	If other please list:			Units*:	Enter Units		
			Load Reduction				
Drainage area (in square miles):				BMP Implemented:			TMDL?
Enter A Pollutant	If other please list:			Units*:	Enter Units		
			Load Reduction				
Enter A Pollutant	If other please list:			Units*:	Enter Units		
			Load Reduction				
Enter A Pollutant	If other please list:			Units*:	Enter Units		
			Load Reduction				
* Must be reported in one of these available units							
**STEPL can be used to calculate Load Reduction. It can be found at: <a href="http://it.tetrattech-ffx.com/step1">http://it.tetrattech-ffx.com/step1</a>							

**APPENDIX D**  
**TABLE OF ITEMS FOR REVIEW**

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**TABLE OF ITEMS FOR REVIEW**

<b>Item</b>	<b>DESCRIPTION</b>	<b>DUE DATE</b>	<b>% Work Complete</b>	<b>Date Submitted</b>
A.	PLANS AND COMPLIANCE REQUIREMENTS			
	GPS information for Project site	Previously Completed	100%	X
	Project Assessment Evaluation Plan (PAEP)	Previously Completed	100%	X
	Non Point Source Pollution Reduction Project Follow-up Survey Form	Annually	100%	X
	Monitoring Plan (MP)	X	100%	X
	Monitoring Reports	N/A	NA	X
	Quality Assurance Project Plan (QAPP)	Previously Completed	100%	X
	Copy of final CEQA/NEPA Documentation	Complete	100%	X
	Land Owner Agreement(s)	Complete	100%	X
	Applicable Permits		100%	X
B	WORK TO BE PERFORMED BY GRANTEE			
	100% Construction Documents and Specifications	X	100%	X
	Notice to Proceed	X	100%	X
	Written approvals from Landowners (TCEs)	X	100%	X
	Meeting Minutes	Quarterly as applicable	NA	X
	As-Built Drawings	X	100%	X
	Documentation of Stakeholder Meetings	Quarterly as applicable	NA	X
	INVOICING	Quarterly	NA	X
	REPORTS			
	Progress Reports by the twentieth (20 <sup>th</sup> ) of the month following the end of the calendar quarter (March, June, September, and December).	Quarterly	NA	X
	Natural Resource Projects Inventory (NRPI) Project Survey Form	Before final invoice	0%	X
	Draft Project Report	X	100%	X
	Final Project Report	X	100%	6/30/2011

**APPENDIX E**  
**CONSTRUCTION MONITORING**

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