

**Napa River Rutherford Reach Restoration Project
Phase I, Reaches 1 and 2**

FINAL PROJECT REPORT



**Napa County, California
May 30, 2011**

State Revolving Fund Project No: C-06-6924-110
SWRCB Agreement No's: 08-348-550 and 06-282-552-01

Total Project Cost: \$2,181,209.47 (Final Design and Construction of Phase I – Reaches 1 and 2)

Funding Sources:

2005-2006 Consolidated Grants – Proposition 40-50 Agricultural Water Quality Program: \$130,192.92
American Reinvestment and Recovery Act of 2009 (SWRCB and USEPA): \$977,306.99
Napa County Measure “A”: \$1,073,709.56

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County of Napa
Napa River Rutherford Reach Restoration Project
Phase 1 - Reaches 1 and 2
Clean Water State Revolving Fund Project No. C-06-6924-110
SWRCB Agreement Nos. 08-348-550 and 06-282-552-1

FINAL PROJECT REPORT
May 30, 2011

1.0 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 1 of the Project which consists of Reaches 1 and 2, which was finished at the end of 2010 and funded by two grants from the State of California Water Resources Control Board (SWRCB). Final design and construction of the remaining 7 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 levee setbacks, planting and 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, will take place 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.

1.2.1 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. However, these berms do not represent a continuous (reach-wide) flood protection system.

1.2.2 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.

1.2.3 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; 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 an 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 1 of the overall restoration plan for the Rutherford Reach of the Napa River and addresses implementation of the restoration project in Reaches 1 and 2.

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

2.0 MANAGEMENT AND MONITORING ACTIVITIES

2.1 Activities Completed During Phase 1

Phase 1 of the Napa River Rutherford Reach Restoration Project implementation, which treats Napa River Reaches 1 and 2, was originally funded by a SWRCB Consolidated Prop. 40/50 Agricultural Water Quality Program grant in the amount of \$1,000,000. However, this grant was frozen as of December 17, 2008 due to the State fiscal crisis after only a portion (\$130,192.92) of the grant was expended on design related activities. Ultimately the grant was replaced/supplemented with \$977,307 in American Recovery and Reinvestment Act (ARRA) (stimulus) funds through the State Revolving Fund (SRF). Both grants were matched with a total of \$1,073,709.56 of Napa County Measure A funds to make up the balance of the total cost of final design and construction of Phase 1 for a total project cost of \$2,181,209.47.

Phase 1 design was completed by ICF Jones & Stokes, with engineering subcontractors Riechers Spence & Associates, Inc. and Northwest Hydraulic Consultants, with consultation input from Prunuske Chatham Inc.

The Project has been permitted 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. 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 1/Reaches 1 and 2 of the Project.

Construction of Phase I began during the summer of 2009. The Project limits started approximately 850 feet south of Zinfandel Lane, which is located approximately 2 miles southeast of St. Helena. The Project continued south for approximately 6,000 feet. Due to the timing delays associated with the freezing of the original Prop. 40/50 grant funding, construction of the Project needed to be divided into two seasons of construction. In 2009, construction could only be completed on the East Bank of subreaches 1 and 2. Construction on the West Bank and installation of the in-stream structures was postponed until the following year when access and de-watering operations in the River could take place during low flows.

Construction included re-grading channel banks per design plans to stabilize and reduce sediment loads into the River. Floodplain bench features were created in specific areas to help widen the overall riparian cross section. The benches were excavated to specific elevations per the design plans, which will allow them to activate during specific storm events.

Large Woody Debris (LWD) structures were installed throughout both reaches to provide additional refugia for native migrating fish. An alcove feature was constructed to provide an area of backwater refugia during high flows in the River. Existing agricultural berms located along the west bank of the river were reconstructed and set back further landward than the existing berms to increase the River's riparian area.

Figure 1 represents Project features that were constructed and installed and includes the locations of photographic monitoring points. The photos from these monitoring points are presented in **Appendix B**.

Throughout the construction season weekly meetings were conducted to facilitate communication between the property owners, contractor, and County throughout the Project. 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 1 was completed on November 5, 2010. All disturbed areas were stabilized with erosion control measures implemented in addition to Stormwater Pollution Prevention Plan (SWPPP) requirements.

Phase 1 Constructed Project Features Summary

Graded River Restoration Elements

Instream Floodplain Benches	4
Alcove	1
Graded Banks	3,600 Linear Feet
Setback Berm	3,614 Linear Feet

Instream Habitat Structures

LWD Toe Log Installations	2
LWD Spider Logs	3
Boulder Cluster	1 (6 Boulders)

Riparian Habitat Restoration

Revegetation	5.69 Acres
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Figure 1 is a map showing the locations of the Phase 1 constructed features in Reaches 1 and 2 within the context of the entire 9 reaches of the Rutherford project.

As-Built Drawings

As-Built drawings for the completed Phase 1 portions of the Project are included on the Compact Disc (CD) enclosed as Appendix A to this Project Certification.

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>

Photo Documentation of Constructed Features

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

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. A copy of the submitted form is included in Appendix C.

2.2 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 1 portion of the overall Rutherford Project as it pertains to these goals including the PAEP stated desired outcomes and targets is summarized in Tables 1 through 4 and discussed below.

2.2.1 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 1 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. There was 100% landowner participation in Phase 1 construction and ongoing adaptive management: Guggenhime, Quintessa, The Ranch/Sutter Home, Frog's Leap and Caymus properties.

2.2.2 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.

To measure the reduction in fine sediment source as result of the Project, the one-time removal as sediment available for delivery to the channel was measured 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 79,300 metric tons (58,000+21,300 metric tons) (49,563 cubic meters) (64,826 cubic 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 5,165 metric tons/year [3,965+(750*1.6 miles)], or 27% of the total target reduction for the Napa River watershed from channel incision sources.

The target goal is to reduce the surface area of eroding banks in the entire Rutherford Reach (Reaches 1-9) by 75%, which is measured annually under the channel monitoring survey conducted by Napa County each June. Comparison of eroding banks mapped during the first two annual channel maintenance surveys, shows that eroding bank length was reduced in the Rutherford Reach (Reaches 1-9) by 38% from 14,674 to 9,032 feet. Approximately 1,900 feet of this reduction was due to treatment of eroding banks with restoration construction in Phase 1 Reaches 1 and 2 in 2009.

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.

2.2.3 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 1 construction short term habitat goals have been met through construction of 4 high flow refugia benches and an alcove. In the 2009-2010 and 2010-2011 winter seasons (subsequent to construction), the benches have all inundated as predicted at the design flow events. High flow velocity monitoring conducted by the Napa County Resource Conservation District (RCD) staff in winter 2011 demonstrated that velocity targets for steelhead rearing habitat were being achieved in the alcove, which inundates at a lower flood frequency than the other 4 benches. The RCD is scheduled to monitor the performance of the instream habitat structures during a low flow this spring, and the results will be reported as part of ongoing Project monitoring reports.

All constructed instream habitat structures have persisted through the first winter season since they have been installed.

During Phase 1, 5.69 acres of native riparian cover were planted. A total of 25 plants died and were replaced after winter 2009, indicating a greater than 90% survival of native plants planted in treated areas in Phase 1a (east bank). Supplemental planting and soil amendments were completed on the Guggenhime and Quintessa benches in summer 2010. Planting for Phase 1b (west bank) was completed in winter 2010. Irrigation systems have been installed for use in the summer months. Plant establishment and maintenance for all plants in Phase 1 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.

2.2.4 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.

3.0 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. We learned that 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 the 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 we discovered with the large scale grading to create floodplain benches and the alcove was that the exposed subsoils were not all conducive to erosion control grasses and plant growth. To ensure we had adequate plant survival, we supplemented the soil with inoculants and compost and also augmented plantings after the first season of growth on Guggenhime and Quintessa properties and increased the planting density for future phases. When we found deficient soils due to a different composition in the subsurface than what existed on the surface and we saved and replaced topsoil for future phases, we also needed to change planned vegetation types when we discovered groundwater seeps. It was also learned that it is very important for maintenance

crews to follow the same contractor specifications for vegetation planting and to work with the County and design engineer to update and refine practices—establishing the adaptive management feedback loop.

To control sedimentation to the stream channel in the winter immediately following grading, we supplemented BMPs when scour occurred behind installed toe log structures. We learned that a heavier erosion control fabric is required in promontories at the end of each bench to withstand the shear force of high flows until the willow brush mattresses become established. We are also reconsidering the type of pin to use to hold down the erosion control fabric until vegetation becomes established—biodegradable, or stronger and longer, but not biodegradable.

4.0 PROJECT OUTREACH

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 and Annual Rutherford Dust Society (RDS) Dinner.

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.

5.0 PROJECT FUNDING

A summary of the overall costs and funding for Phase 1 of the Project is shown below:

Project Activity	Total Costs	Funding Source		
		Prop. 40/50	ARRA/CSRF	County Measure A
Final Design				
Professional Services	\$440,828.00	\$130,192.92	\$0.00	\$310,635.08
County Labor and Related Coordination	\$81,072.60	\$0.00	\$0.00	\$81,072.60
Construction				
Bid Award-Professional Services	\$40,000.00	\$0.00	\$40,000.00	\$0.00
Construction	\$1,601,854.87	\$0.00	\$919,852.99	\$682,001.88
PM/Admin/Contracting	\$17,454.00	\$0.00	\$17,454.00	\$0.00
TOTAL PROJECT	\$2,181,209.47	\$130,192.92	\$977,306.99	\$1,073,709.56

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

6.0 PLANNED ACTIVITIES

6.1 Future Design and Construction Phases

As described above, the Rutherford Project is being constructed in phases: Phase 2, which included Reach 3 funded by a SWRCB 319(h) non-point source grant program and County Measure A matching funds, was also completed in 2010. Final Design for Phase 3, including Reach 4, has been completed; and plans are underway for construction in 2011 and 2012. Reach 4 will be funded by grants from the United States Environmental Protection Agency (EPA) (east bank Reach 4) and the State Department of Parks and Recreation Habitat Conservation Fund for riparian revegetation and in-stream habitat features and is pending funding from the SWRCB 319(h) non-point source grant program (west bank 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, and other grant 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.

6.2 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.

7.0 CONCLUSION

This concludes the Final Project Report for Phase 1 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.

For Further Information

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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).

TABLE 1. PLANNING, RESEARCH, MONITORING AND ASSESSMENT PROJECT PERFORMANCE MEASURES
 Napa River Rutherford Reach Restoration Project – Reaches 1&2

Performance as of April 2011

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 landowners participating in ongoing maintenance program.

TABLE 2. POLLUTANT LOAD REDUCTION PROJECT PERFORMANCE MEASURES
 Napa River Rutherford Reach Restoration Project – Reaches 1&2

Performance as of April 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>Treat 3,350 linear feet of actively eroding streambank.</p> <p>Retain approximately 6,000 feet of stabilized stream channel.</p> <p>Reduce length of actively eroding stream banks throughout the Rutherford Reach (versus 2005 baseline survey) by 75%.</p> <p>31,000 cubic yards of channel bank sediment source removed through grading.</p>	<p>Met 92% of original target (3,075 feet of graded streambank) as part of Phase 1 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>Goal exceeded by removal of 64,826 cubic yards through grading in Phase 1.</p>

TABLE 3A. AQUATIC HABITAT RESTORATION PROJECT PERFORMANCE MEASURES
 Napa River Rutherford Reach Restoration Project – Reaches 1&2

Performance as of April 2011

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 2 high-flow refugia in treated reach. 75% persistence of installed instream habitat enhancement structures.	In progress. Long term monitoring goal. Monitoring Plan is in place. In progress. Long term monitoring goal. Monitoring Plan is in place. Target exceeded. % high flow refugia have been created as part of Phase 1. To date 100% of the installed instream habitat enhancement structures have persisted.

TABLE 3B. RIPARIAN AND FLOODPLAIN HABITAT RESTORATION PROJECT PERFORMANCE MEASURES
 Napa River Rutherford Reach Restoration Project – Reaches 1&2

Performance as of April 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>Six (6) acres of native riparian cover.</p> <p>75% survival of native plants planted in treated areas.</p>	<p>95% of original target (5.69 acres) of revegetation was performed as part of Phase 1. 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 4. EDUCATION, OUTREACH, AND CAPACITY-BUILDING PROJECT PERFORMANCE MEASURES
 Napa River Rutherford Reach Restoration Project – Reaches 1&2

Performance as of April 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 maintenance 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 1 – Reaches 1 and 2 and the development and approval of the Project monitoring plan by the resource agencies.

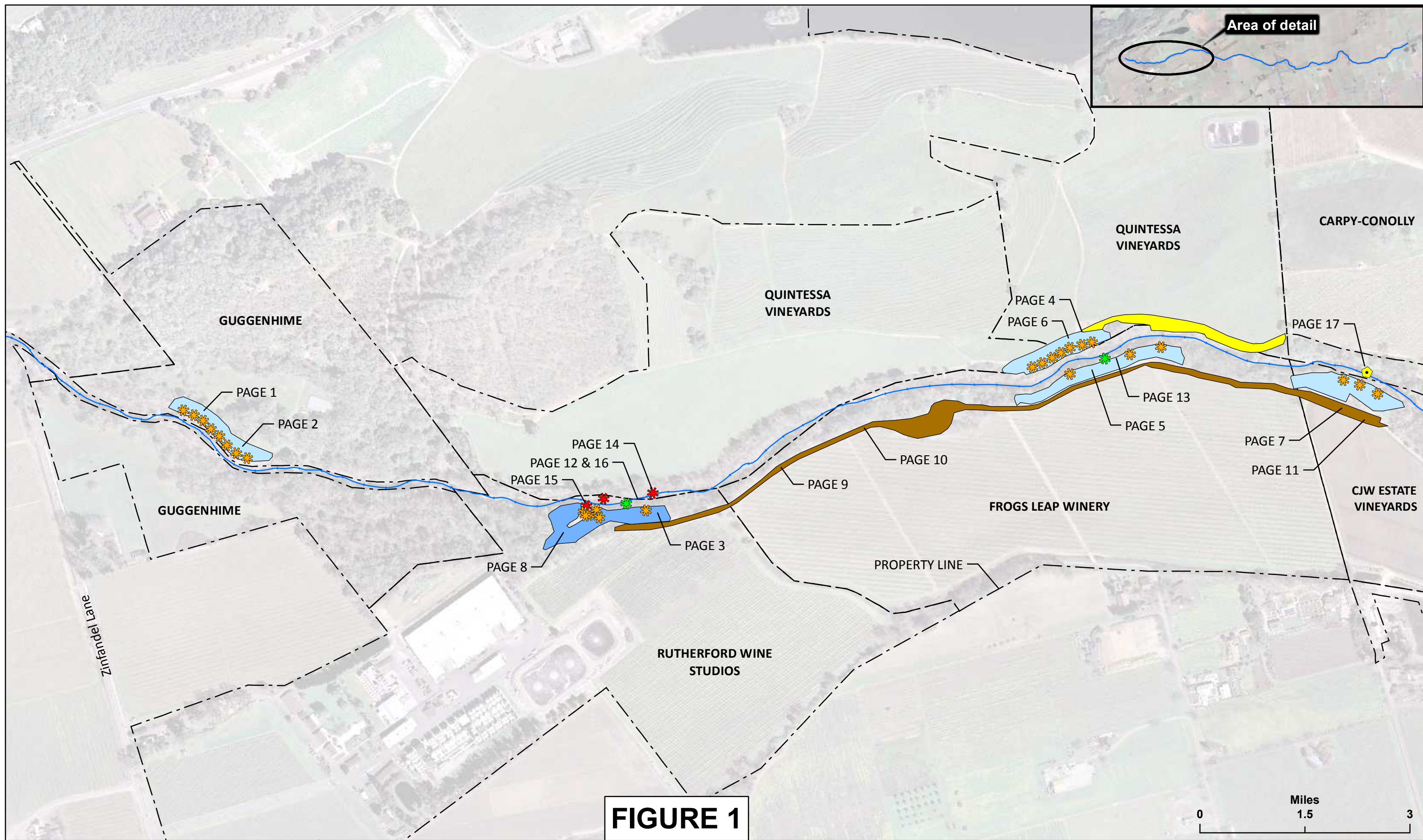


FIGURE 1

Miles
0 1.5 3

- Instream Bench
- Alcove
- Graded slope
- Setback berm
- Boulder Cluster
- Bench Log
- Spider Log
- Toe Log Structure

Napa River Rutherford Restoration Project
Phase I Constructed Features & Photograph Monitoring Locations (Appendix B)

— PAGE 1 = Photo Monitoring Location (Appenx. B)

APPENDIX A
AS-BUILT DRAWINGS

APPENDIX B

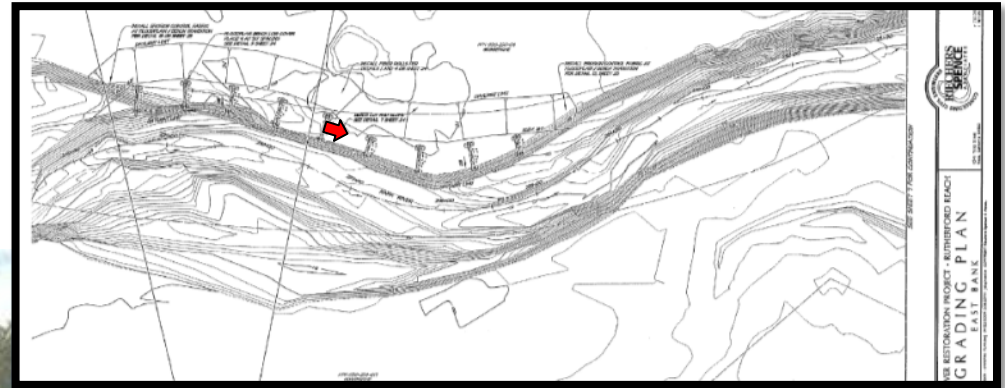
PRE- AND POST-CONSTRUCTION PHOTOGRAPHS

Bench Terraces

Phase 1

East and West Banks

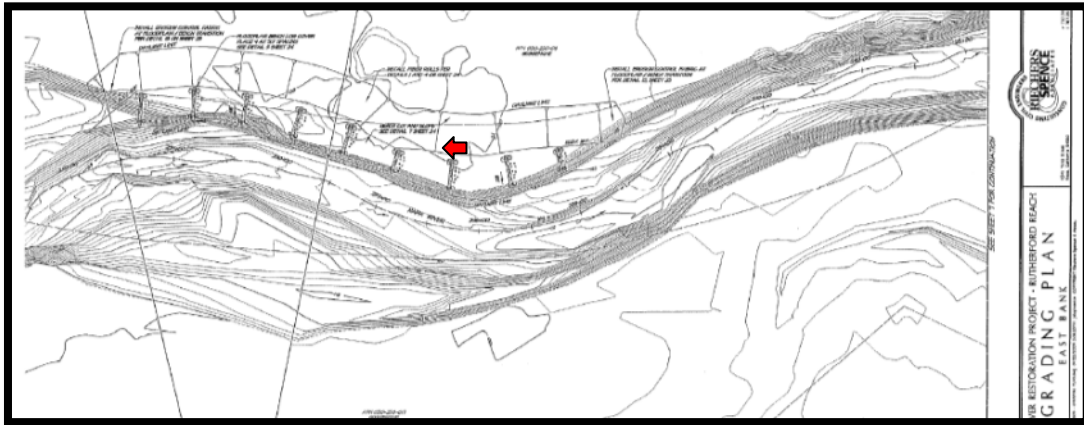
2009-2010



June 2009



January 2010



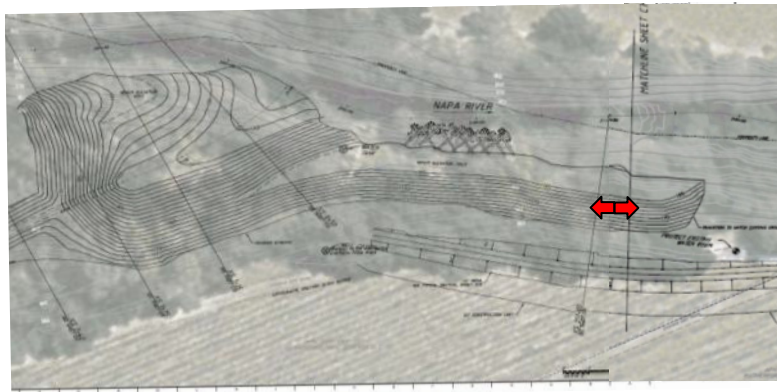
June 2009

*Looking
upstream*



Jack Betourne, Napa County

January 2010



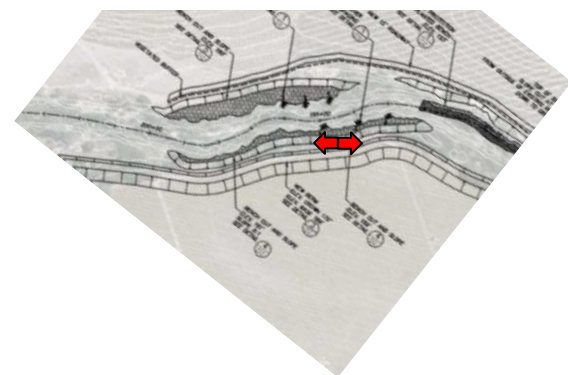
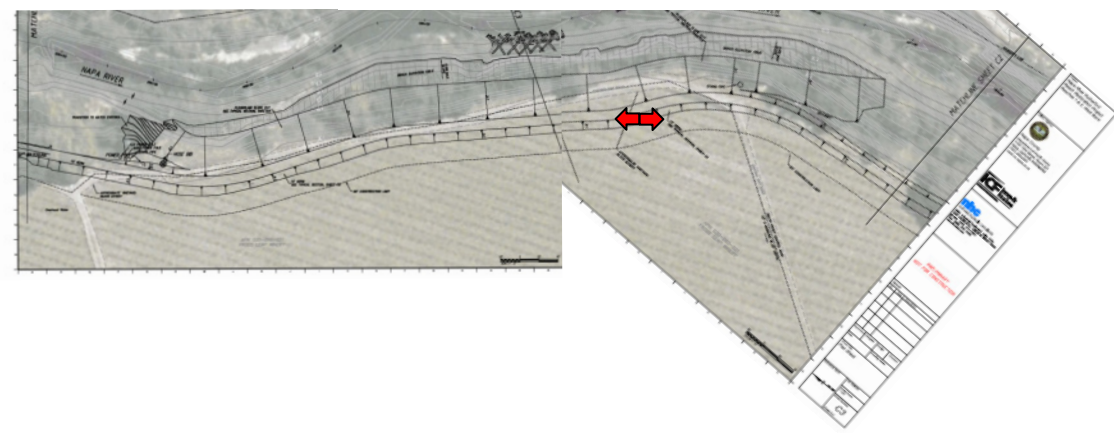
Looking Upstream from Station 21,605 West Bank to Station 21,625



Looking Upstream from Station 21,750



Looking Downstream from Station 21,750



NHC 2010

Looking Upstream

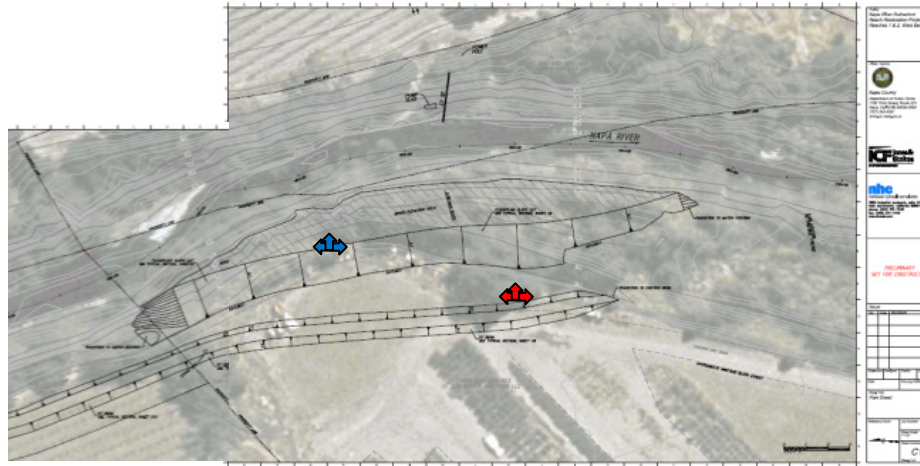


NHC 2010

Looking Downstream

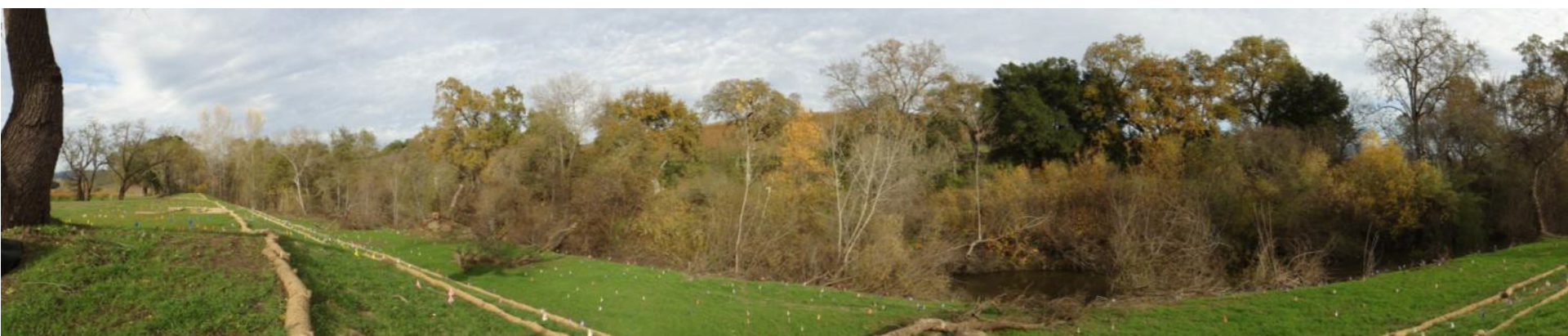


Station 19,800 From East Bank Bench to West Bank Bench March 2011



Looking Towards Channel From West Bank Station 18,400

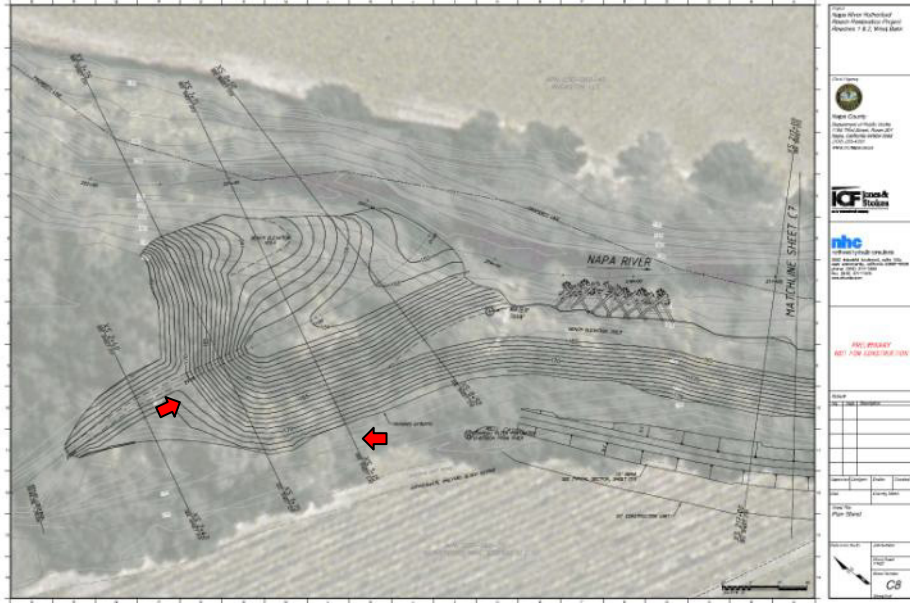
April 2010



Looking Towards Channel From West Bank Station 18,200

December 2010

Alcove
Phase 1
West Bank
2010

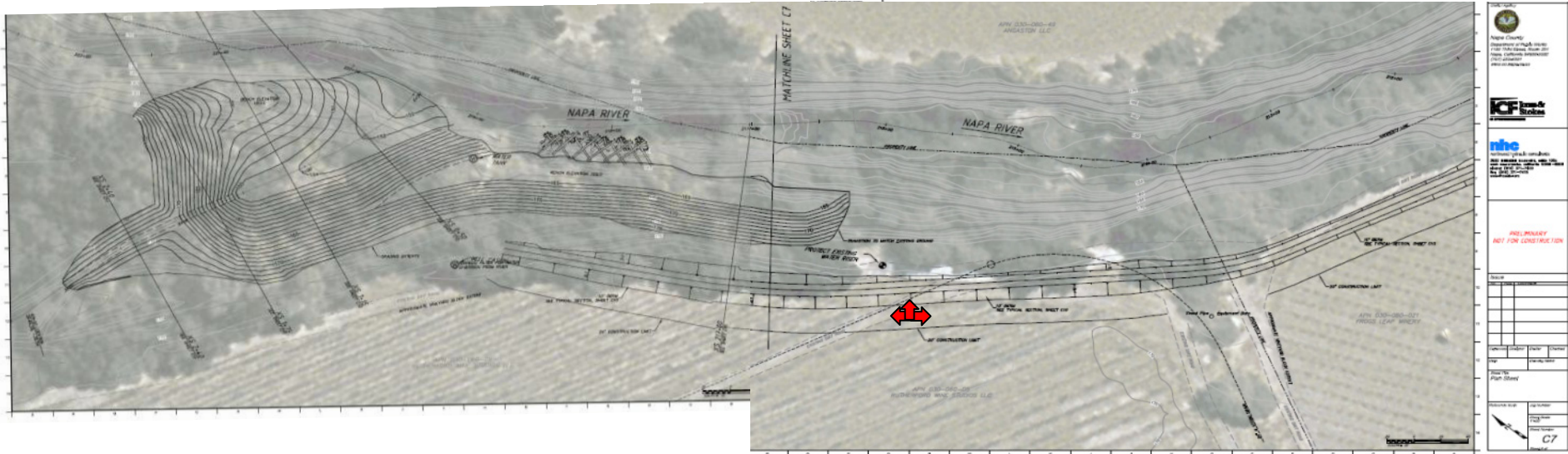


Setback Berms

Phase 1

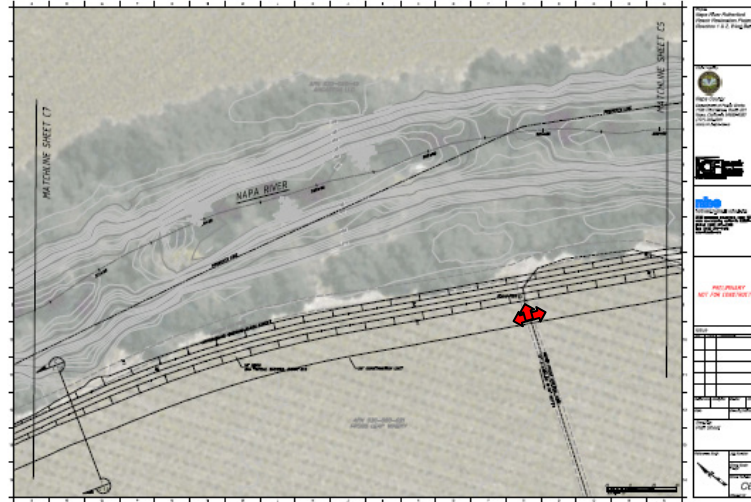
West Bank

2010

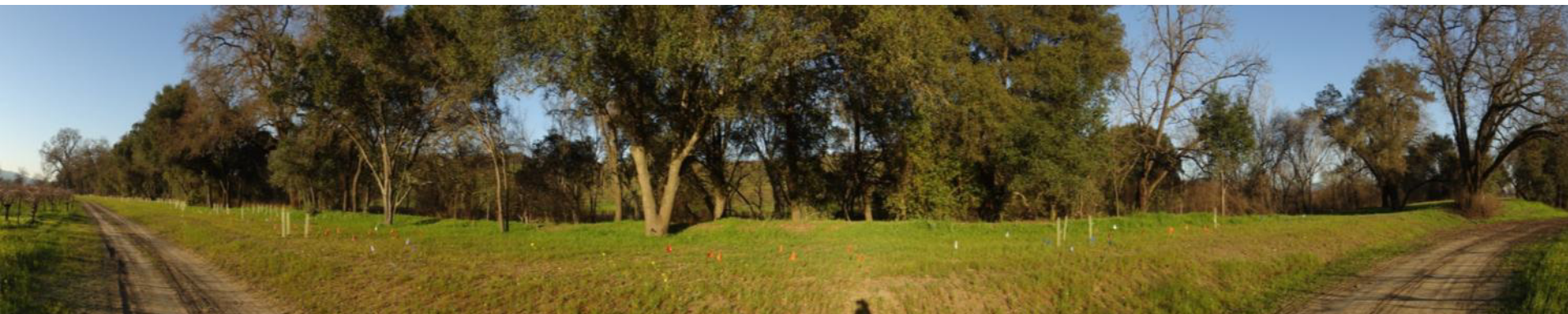


Logos for Napa County, ICF, and nbc. Below the logos is a table with columns for Date, Description, and Status. The table is currently empty. Below the table is a section for "Plan Sheet" with a grid and a north arrow. The grid contains the text "C7".

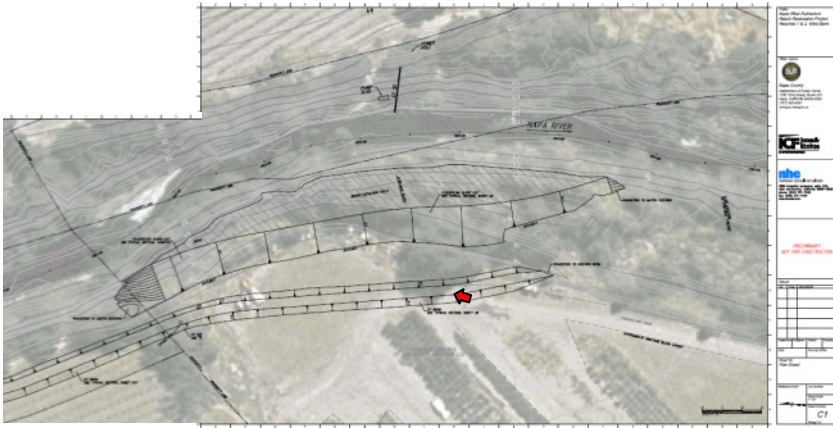




April 2010



January 2011



April 2010



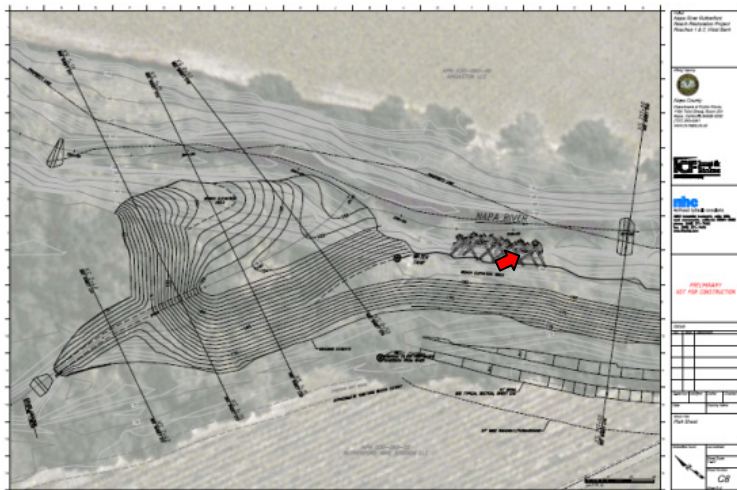
December 2010

Instream Structures

Phase 1

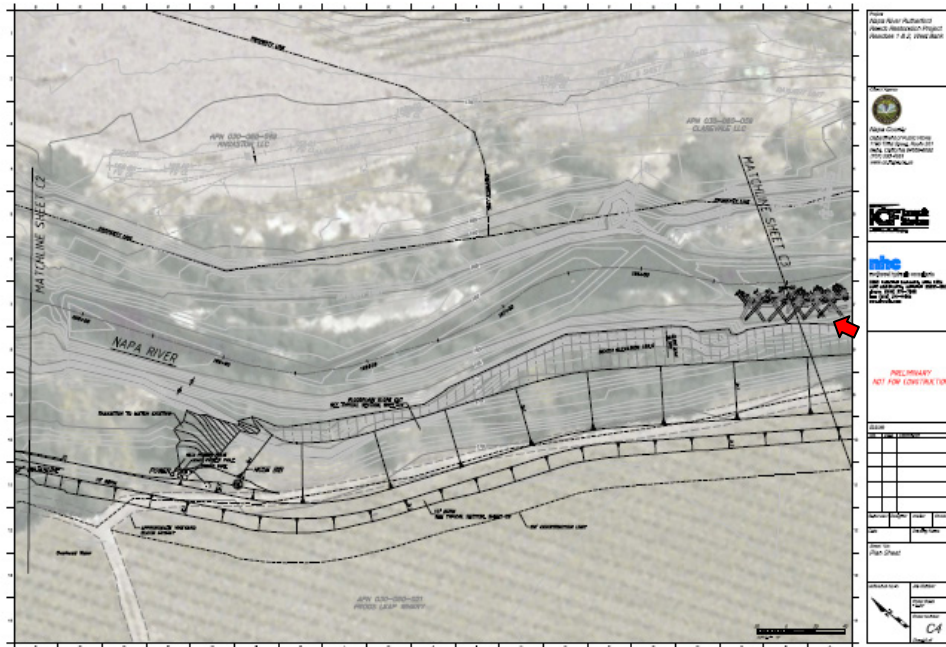
West Bank

2010





Looking Upstream From Station 19,420 to Station 19,450





NHC November 2010

Looking Upstream From Station 21,870 to Station 21,900



2010-06-02

June 2010

Looking Downstream From Station 21,940 to Station 21,900



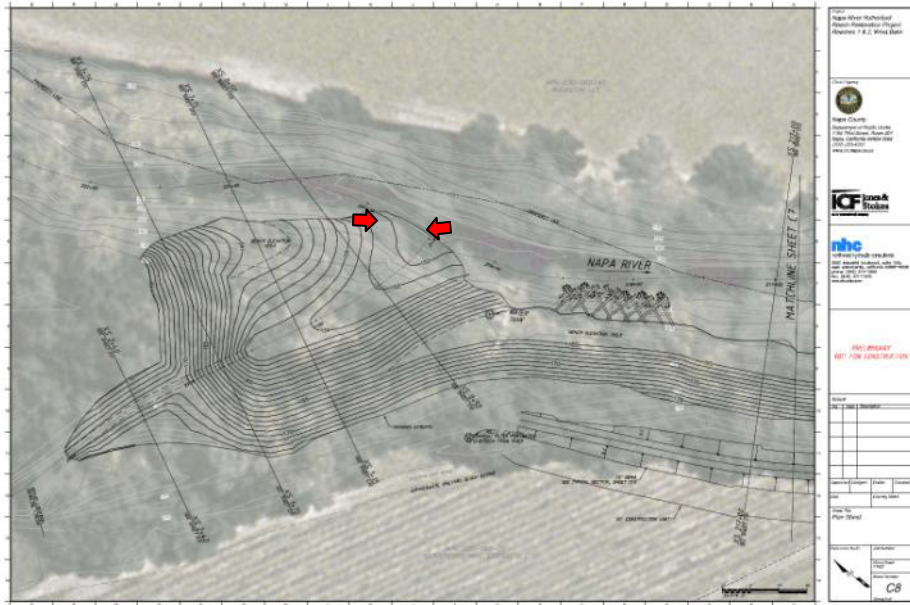
NHC November 2010

Looking Downstream From Station 21,940 West Bank to Station 21,900



NHC November 2010

Looking Downstream From Station 21,920 West Bank to Station 21,900



Looking Upstream From Station 22,050 to Station 21,100

June 2010



Looking Downstream From Station 22,200 to Station 21,100

October 2010



Looking Upstream From Station 22,050 to Station 21,100

October 2010



Looking Upstream From Station 21,690 to Station 21,700



Looking Upstream From Station 21,690 to Station 21,700
November 2010





June 2011

NHC September 2010

APPENDIX C

ANNUAL NON-POINT SOURCE POLLUTION REDUCTION PROJECT

FOLLOW-UP SURVEY FORM

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

Project Information

Project Title: Napa River Rutherford Reach Restoration Project

Pin #: 13041

SB Project #: 08-609-552 and 08-348-550

Contact Name: Richard Thomasser, Napa County Flood Control and Water Conservation District

Contact Phone: 707-259-8657

Contact Email: Richard.Thomasser@CountyofNapa.org

Project start date: 6/1/2010

Project Completion date - m/yr: 11/2010 for Construction; 1/2011 for Revegetation

Extension Requested ?:

Reason for Extension ?:

Extension Approved ?:

New Completion date - m/yr:

No Load Reduction explanation:

Load Reductions for 2010

Drainage area (in square miles):

85

BMP Implemented: Graded Channel Banks

Y

Sediment

If other please list: _____

4,315

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

Load Reductions from Newly Implemented BMPs - 2006 - 2009 Grants

Napa River Rutherford Reach Phase 1b

Drainage area (in square miles): 83

BMP Implemented: Graded Channel 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: <http://it.tetrattech-ffx.com/step1>**

APPENDIX D

TABLE OF ITEMS FOR REVIEW

TABLE OF ITEMS FOR REVIEW

Item	DESCRIPTION	DUE DATE	% Work Complete	Date Submitted
A.	PLANS AND COMPLIANCE REQUIREMENTS			
	GPS information for Project site	Previously Completed	100%	July 2008
	Project Assessment Evaluation Plan (PAEP)	Previously Completed	100%	September 2008
	Non Point Source Pollution Reduction Project Follow-up Survey Form	Annually	100%	December 2010
	Monitoring Plan (MP)	August 2009	100%	February 2009
	Monitoring Reports	N/A	NA	NA
	Quality Assurance Project Plan (QAPP)	Previously Completed	100%	September 2008
	Copy of final CEQA/NEPA Documentation	Complete	100%	November 2008
	Land Owner Agreement(s)	Complete	100%	July 2008
	Applicable Permits	December 2008	100%	August 2009 (east bank)
B	WORK TO BE PERFORMED BY GRANTEE			
	100% Construction Documents and Specifications	August 2009	100%	July 2009 (east bank)
	Notice to Proceed	August 2009	100%	August 2009
	Written approvals from Landowners (TCEs)	August 2009	100%	July 2009
	Meeting Minutes	Quarterly as applicable	NA	With quarterly reports as applicable.
	As-Built Drawings	December 31, 2010	100%	April 2011
	Documentation of Stakeholder Meetings	Quarterly as applicable	NA	With quarterly reports as applicable.
	INVOICING	Quarterly	NA	With quarterly reports.
	REPORTS			
	Progress Reports by the twentieth (20 th) of the month following the end of the calendar quarter (March, June, September, and December).	Quarterly	NA	Quarterly
	Natural Resource Projects Inventory (NRPI) Project Survey Form	Before final invoice	0%	April 2011
	Draft Project Report	3/30/2011	100%	April 14, 2011
	Final Project Report	4/30/2011	100%	April 29, 2011