Napa River Rutherford Reach Restoration Project
Annual Maintenance and Monitoring Survey


Napa River July 11, 2011

July 2011

Prepared by:
Napa County Flood Control and
Water Conservation District
Napa County, California

TABLE OF CONTENTS

Figures

Background:

The maintenance program for the Rutherford Reach of the Napa River has been developed by the Rutherford Landowner Advisory Committee (LAC) and Napa County Flood Control and Water Conservation District (District) to support the Napa River Rutherford Reach Restoration Project (Project) and to guide implementation of routine maintenance activities within the Rutherford Reach of the Napa River. The maintenance program has been developed to carefully balance the needs of local landowners with protecting and enhancing the natural resources of the Napa River. As a result, affected landowners formed the Rutherford Dust Napa River Restoration Team (also known as "RDRT") and have worked with Napa County and its affiliate agencies to design and implement a comprehensive reach-scale restoration called the Napa River Rutherford Reach Restoration Project (Project). The Project area is comprised of privately-held parcels adjacent to a 4.5-mile reach of the Napa River south of the City of Saint Helena, extending from Zinfandel Lane in the north, downstream to Oakville Cross Road in the south (Figure 1).

The maintenance program for the Project was developed by the RDRT Landowner Advisory Committee (LAC) and the Napa County Flood Control and Water Conservation District to support routine maintenance activities within the Rutherford Reach needed for a successful Project. The maintenance program balances the needs of local landowners with protection and enhancement of the river's natural resources. For further details regarding the maintenance program please refer to "*Final Maintenance Plan for the Napa River Rutherford Reach Restoration Project*" (Jones and Stokes; August 2008, http://www.napawatersheds.org/files/managed/Document/3590/Rutherford%20Reach%20Maintenance%20Plan.pdf). Critical elements of that plan are described below.

As part of the maintenance program, District staff in coordination with the LAC and the Napa County RCD, conducts an annual stream survey to identify and assess issues of maintenance concern. The survey, data analysis, and implementation of maintenance activities are facilitated by the District's Rutherford Reach Maintenance Coordinator (contact information below). This report presents the results and recommendations of the second annual stream survey conducted between June 10th and July 11th, 2011.

Maintenance activities must be in compliance with applicable resource agency permits in conjunction with best management practices (BMPs) specified in the final Maintenance Plan. Permitted activities may include:

- debris (man-made) removal;
- downed tree (also referred to as large woody debris or LWD) relocation and/or stabilization;
- vegetation management, including invasive non-native and Pierce's disease host vegetation control, management of emergent (young) in-channel vegetation, and planting for erosion control management;
- installation of erosion control fabric or coir logs;
- maintenance of constructed features, including floodplain benches, vegetative buffers, aquatic habitat enhancement structures, and bank stabilization structures.

As of the time of this survey construction has been complete through Reach 3 resulting in the creation of 9 flood plain benches and 1 backwater alcove, installation of 27 bench logs, 10 rood wad structures, 1 boulder cluster and the setting back of over 8500 linear feet (1.6 miles) of agricultural berms in order to increase riparian habitat width (Figure 4). Therefore, the focus of the 2011 stream survey included the review of the functionality of these features in Reaches 1 through 3 in addition to the regular activities of identifying and documenting target invasive plant species, Pierce Disease host plant species, potentially erosive LWD, bank erosion and accumulated trash or debris. Installed structures and graded areas that were not in need of maintenance will be reported on in a separate, detailed annual habitat monitoring report relative to habitat value and functionality of constructed restoration features.

Annual Stream Survey Objectives:

The stream survey begins the maintenance season by collecting and providing field data that will inform the creation of the annual stream maintenance work plan. The annual stream survey also captures data to be utilized in the annual Project monitoring report required to comply with funding and regulatory agency requirements. This additional monitoring data collected will be presented in a separate annual monitoring report. A team of resource specialists, including a geomorphologist, ecologist, fisheries biologist, invasive plant expert, and a landowner representative conduct the survey with assistance from District interns.

The essential maintenance aspects of the Annual Stream Survey are to:

- Identify and prioritize maintenance actions, including vegetation management, large woody debris (LWD) realignment and/or relocation, debris (e.g. tires, shopping carts, barrels, etc.) and trash removal, and biotechnical stream bank stabilization;
- Evaluate the status of and define any steps needed to maintain the function of constructed features and in-stream habitat structures;
- Identify infestations of non-native invasive and Pierce's disease host plant species, and define control treatments to the extent practicable;
- Respond to Landowners requests for maintenance actions within the riparian corridor on their property.

A suite of parameters were measured, recorded and mapped using digital photography and handheld GPS computers customized to log specific maintenance data parameters. Separate GPS/GIS files were created to capture distinct categories of interest during the survey, the files and the associated data fields include:

- *Maintenance* (Date, River Station, Bank Location, Problem, Invasive Species, Pierce Host, Patch Size, Priority, Recommendation, Photo, Notes, LWD maintenance)
- *Eroding Stream Banks* (Date, River Station, Length, Bank Location, Bank Erosion Location, Average Bank Erosion Height, Bank Condition, Treatment Element, Instability Element Description, Recommendation, Priority, Notes, Photo)
- *Large Woody Debris* (Date, River Station, Length, Bedform Association, LWD Location, LWD Function, Number of Pieces/Configuration, Bank Erosion Potential, LWD Type, Recruitment Mechanism, DBH, Riffle Crest Depth, Max Pool Depth, Structure Problem, Repair Recommended, Shelter Complex, Shelter Cover, Notes Photo)
- *Photographic Documentation Point* (Date, River Station, , Number of Photos, Notes)

Survey Results:

The annual stream survey was conducted between June 10th and July 11th, 2011 approximately 1 month later then previous surveys due to the unusually late, high river flows and late rain event experienced on June 28th which complicated instream river access. Typical weather conditions included overcast to partly sunny skies with 20-50% cloud coverage and air temperatures ranging 61° - 70° Fahrenheit. Average water temperature ranged between 58° - 63° Fahrenheit, stream flow measured at the USGS stream gage (ID#11456000) located approximately 1100 feet upstream the beginning of the Project reach ranged from 27.0 – 3.4 cubic feet per second (cfs).

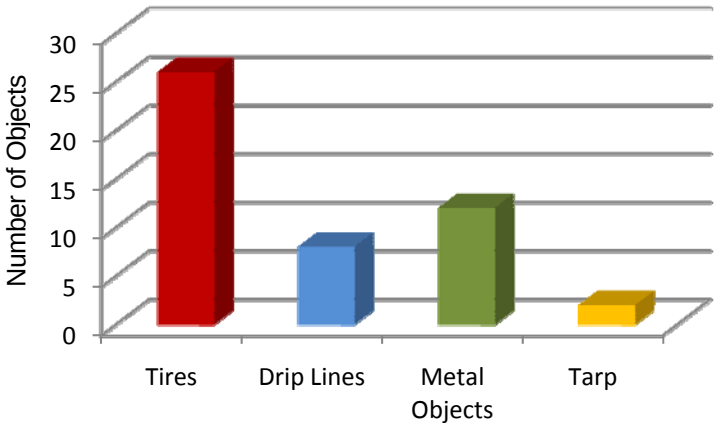
Issues documented during the stream survey included trash and debris located in-channel and at the top of the river banks, invasive and Pierce's disease plant species located throughout the riparian zone, eroding stream banks and potentially erosive large woody debris jams located in-channel. A total of 351 features were documented within the Project area. The following subsections describe these issues in details and any potential maintenance issues identified within the Project area.

Trash and Debris:

A total of 48 occurrences of trash and debris were documented in the Project area with the dominant trash and debris type being tires (26) and the remaining (22) occurrences of trash and debris being various objects including irrigation drip lines, tarps, agricultural smudge pots, large residential kitchen and electronic appliances, an automobile rim and a lawn mower. Figure 2 shows the location of the trash and debris documented, the greatest accumulation of trash was found in Reach 8. Graph 1

below represents the amount and types of trash documented during the stream survey. Several incidences of metal debris storage near or on the top of the river bank were noted (Picture 1). It is possible that such debris could be washed into the river channel during high flow events. This situation could be remedied if the landowners were mindful of this situation and either disposed of any such debris of moved it at least 100 feet back from the top of the river bank. This issue will be brought to landowner's attention as part of regular outreach regarding the river maintenance program.

Graph 1: Trash and Debris



Picture 1: Trash and Debris

Invasive Non-Native and Pierce Host Plants:

A total of 57 occurrences of invasive non-native and Pierce host plants were identified and will be targeted for treatment within the Project area (Figure 3). Giant reed, Himalaya blackberry, periwinkle (*Vinca sp.*) and native and hybridized grape species were the dominant target plants identified; other target species including tree-of heaven and red sesbania occurrences were limited. Species such as poison hemlock, fennel, etc. were observed but not documented during the survey as a result of land owner's requests in previous meetings to focus on and use funds for treatment of only invasive plant species that are considered Pierce host's species as well. Over 29,185 square feet (sqft) of giant reed, 19,166 sqft of Himalaya blackberry, 18,295 of periwinkle and 13,939 sqft of grape species were mapped. However, it is important to note that there is significantly more grape and periwinkle present beyond the river's top of bank; in general the extent of area that can be funding and treated under the maintenance program extend s to the top of bank in the riparian zone. For this reason landowners are encouraged to contact the maintenance lead with requests for maintenance of invasive and Pierce host species in the riparian zone beyond the top of bank. Additionally, to a large extent Himalayan blackberry and grape occur in a near continuous band of various width throughout the entire 4.5 mile Project reach on both the east and west river banks. In general, previous effort to manage and remove giant reed (arundo) have been successful and the distribution of giant reed was generally limited to those patches not treated previously due to the inability to secure landowner access agreements for treatment in 2010 or small patches that were treated previously but will require minor re-treatment in 2011. As documented in previous surveys, the largest patches of giant reed were documented within Reach 8. Table 1 summarizes the invasive non-native and Pierce host plants documented during the stream survey. Further, Table 1 lists if the species is a Pierce Disease host and ranks each species as a "high" or "moderate" impact invasive species as defined by the California Invasive Plant council (Cal-IPC); the Cal-IPC list primarily includes plants exhibiting some level of invasiveness in native habitats.

Table 1: Invasive Non-Native and Pierce Host Plants

Common Name	Scientific Name	Infested Area (SqFt)	Pierce Disease host	Cal-IPC Ranking
Giant reed	*Arundo donax*	29,185	No	High
CA & Hybrid Grape	*Vitus sp.*	13,939	Yes	None
Himalaya Blackberry	*Rubus armeniacus*	19,166	Yes	High
Red sesbania	*Sesbania punicea*	N/A	No	High
Periwinkle	*Vinca major*	18,295	Yes	Moderate

Tree-of-heaven	*Ailanthus altissima*	N/A	No	Moderate

Other invasive plant and Pierce host species removal activities are currently taking place in Reaches 1 though 3 under the post construction re-vegetation maintenance contract. Species currently being removed included giant reed, Himalaya blackberry, periwinkle (*Vinca sp.*) and native and hybridized grape; amount treat and/or removed through this effort will be quantified and presented on an annual basis at a later date in the final maintenance report.

Large Woody Debris (LWD):

144 naturally recruited large woody debris (LWD)occurrences, greater than one foot in diameter and six feet in length, were documented during the survey. Of those 144 LWD occurrences, 7 were ranked as potential maintenances issues, 3 of which have been prioritized for maintenance actions (thin out smaller wood and/ realign larger wood to reduce flood potential/remove trash from lwd accumulation) in 2011 (Table 2, Figure 2). The remaining 4 LWD occurrences documented as potential maintenances issues will be monitored to track any additional wood accumulation, mobilization, or stream channel scour. The remaining 137 LWD occurrences that were documented are function as significant in-stream fish habitat but do not requiring maintenance. The distribution and function of all 144 occurrences of LWD will be presented in a separate annual habitat monitoring report.

LWD features were ranked as a potentially significant maintenance issue according to the following criteria:

- Potential for LWD to cause imminent bank failure beyond riparian zone.
- Risk to adjacent infrastructure and agriculture (i.e., structures, earthen berms, roads, pumps, utilities, crops).
- Potential for backwater formation.
- Extent of LWD relative to cross-channel distance (i.e. extent of channel blockage/hydraulic radius).
- Location relative to planned Project features that provide opportunity to use LWD in construction.
- Landowner priority.

Table 2 lists the large woody debris structures that were identified for potential maintenance actions.

Table 2: LWD identified for maintenance monitoring or treatment

River Station/Reach	LWD feature	Recommendation	Notes
223+00 (Reach 1)	Wood accumulation (>10), left side of channel, flood deposited	Monitor	Monitor for additional wood accumulation, remove tire from debris
193+00 (Reach 2)	Large single piece of wood, creating large pool	Monitor	Monitor – Documented in 2009, 2010 surveys, appear s to not be causing erosion or significant back watering.
184+70 (Reach 2)	Large wood accumulation/jam (>10), full channel	Maintenance Recommended	Treatment –remove small wood, leave root wad and trunk in place, monitor for back watering/bank erosion
130+90 (Reach 4)	Medium wood accumulation/jam (>10), full channel	Monitor	Monitor for additional wood accumulation, remove metal debris
80+50 (Reach 7)	Medium wood accumulation/jam (>10), half channel	Monitor	Monitor for additional wood accumulation/bank scour, remove metal debris
74+70 (Reach 8)	Medium downed alder w/ large root wad blocking entire channel , minor bank erosion	Maintenance Recommended	Treatment selectively remove large limbs to increase local channel capacity, leave trunk & root wad in place
4+00 (Reach 9)	Large single piece of wood on riffle crest, pool scour	Maintenance Recommended	Treatment – selectively remove large limbs to increase local channel capacity, leave trunk & root wad in place

Installed LWD Structures and Constructed/Graded Benches

As mentioned previously, at the time of this survey, construction has been completed through Reach 3 resulting in the creation of 9 in-stream benches and 1 backwater alcove, installation of 27 bench logs, 10 rood wad structures, 1 boulder cluster and the setting back of over 8500 linear feet (1.6 miles) of agricultural berms. The 37 LWD structures installed in 2009 and 2010 appear to be functioning as designed and are intact and stable. However, the toe log structure adjacent to the instream bench on the Frogs Leap property experienced significant localized bank erosion that required maintenance in February 2011. Maintenance for this structure included the construction of a willow brush mattress to stabilize the stream bank behind the LWD structure; to date the willow brush mattress is functioning well and proving a bio-technical solution to erosion (Pictures 2 and 3). Reach 1-2 construction funds paid for this work; funds did not come out of maintenance assessment. 2 LWD structures (spider logs) were partially buried by seasonal sediment recruitment in the river, diminishing habitat function. These structures will be monitored to see if next season's high flows scour the structures out and restore habitat functionality. Additionally, the downstream end of the instream bench constructed on the Caymus Vineyard property experienced scour and erosion around a large willow tree at river station 181+50 during high flow events in winter 2011. It is recommended that this area of erosion be treated by sloping back the stream bank to 3:1 and planting it with a willow brush mattress. Reach 3 construction funds will pay for this work and not; maintenance assessment funds. No other work is proposed or required for built Project features. See Table 3, Figure 4 for location and details of constructed Project features.

Table 3: Installed LWD Structures and Constructed/Graded Benches

River Station/Reach	LWD feature	Recommendation	Notes
219+70 (Reach 2)	Spider Log	Monitor	Partially buried
219+00 (Reach 2)	Spider Log	Monitor	Partially buried
195+50 (Reach 2)	Toe Log	Monitor	Constructed willow brush mattress to arrest localized stream bank erosion
181+50 (Reach 2)	10x 15 square foot erosion area at end of created floodplain bench undermining large mature willow.	Maintenance Recommended	Grade back eroding area to 3:1 slope and replant with willow brush mattress; to be paid for with construction funds

Picture 2: Installed willow brush mattress

Picture 3: Brush mattress 3 month post installation

Landowner Requests for Maintenance

A total of three landowner requests forms have been received by the District for the 2011 maintenance season. The three landowner request forms requested specific maintenance actions ranging from removal of specific patches of invasive and Pierce Disease host plants to realignment and/or removal of large/small woody debris. Table 4 below details the specifics of the landowner request forms submitted for the 2011 maintenance season.

Table 4: Landowner Request Forms received for maintenance year 2011

River Station/Reach	Property	Requested Work	Recommendation
224+00 -199+00 (Reach 2)	Quintessa Vineyards	Remove non-native Pierce Disease host plants	Non-native and Pierce host plants will be removed during 2011 maintenance season
181+00 – 147+00 (Reach 3 & 4)	Carpy Conolly	Remove non-native Pierce Disease host plants	Non-native and Pierce host plants currently being treated under Reach 3 re-vegetation Contract and Reach 4 construction/re-vegetation contracts
65+00-57+00 (Reach 8)	Frost Fire Vineyards	Thin accumulated wood jam and remediate large eroding stream bank	Accumulated LWD was thinned/removed in 2010 at this location and does not appear to be a problem currently. Bank erosion repair solution currently in design phase, Project implementation funds being sought and Project work expected in 2012/2013.

Recommendations and Work Plan:

The RDRT maintenance survey team recommends the following work be conducted during fiscal year 2011-2012:

- Removal of all trash and debris from the stream channel that can be readily accessed and accomplished with hand labor, pulley or winch assisted mechanisms.
- Limb/ thin large branches at two LWD jams (<12-inches-in-diameter and/or <6-feet-long) adjacent to landowners property as recommended by survey team (see Table 2).
- Treat large accessible patches of invasive and Pierce host plants that are ranked as either "high" or "moderate" impact species, including periwinkle, Himalaya Blackberry, native and hybridized grape species and giant reed. Control and treat red sesbania and tree of heaven patches with appropriate control measures including mechanical removal and herbicide application; this task also includes some re-vegetation planting and irrigation of treatment sites where treatment has left significant gaps in the riparian under story canopy (see Table 1). Table/reference?
- Repair scour/erosion area at end of constructed instream bench on Caymus Vineyard property by sloping back eroding bank to 3:1 slope and replant with willow brush mattress (see Table 3). This work will be funded using construction funds rather than assessment funds.

A more detailed draft work plan with the proposed 2011 maintenance work listed by property owner is included at the end of this report. This draft report and the recommendations contained within will be presented to the LAC for review, evaluation and prioritization of annual maintenance activities at a meeting scheduled for August 2nd, 2011 and will be available for comment to all landowners participating in the Project as well as appropriate regulatory agencies. After completing the review and evaluation and prioritization of the annual maintenance report with the LAC and regulatory agencies ,maintenance activities outlined in this report will begin and likely extent through January 2012. The draft report and a final recommendations and actions report can be accessed electronically from the Watershed Information Center & Conservancy of Napa County (WICC) http://www.napawatersheds.org/app_folders/view/3577. All maintenance work will be conducted in accordance with the regulatory permits issued for the Napa River Rutherford Reach Restoration Project.

Contact: Jeremy Sarrow, Watershed & Flood Control Resources Specialist, NCFCWCD, jeremy.sarrow@countyofnapa.org

References:

Jones and Stokes, G. Hayes, L. Micheli. January 2011. *Monitoring Plan for the Rutherford Reach Restoration of the Napa River.*

Jones and Stokes. August 2008. *Final Maintenance Plan for the Napa River Rutherford Reach Restoration Project.*

USGS; 2011. USGS Real-Time Water Data Web Site for stream gage #11456000 accessed on 07-11-2011: http://waterdata.usgs.gov/nwis/uv?11456000

Acknowledgements:

Stream Survey Team

Paul Blank, Hydrologist, Napa County Resource Conservation District
Gretchen E. Hayes, Geo-morphologist, Tessera Consulting
Jonathan Koehler, Senior biologist, Napa County Resource Conservation District
Jeremy Sarrow, Watershed & Flood Control Resources Specialist, NCFCWCD
Chris Sauer, Watershed Assistant, NCFCWCD

Report Production

Jeremy Sarrow, Watershed & Flood Control Resources Specialist, NCFCWCD

Figure 1: Project Location Map

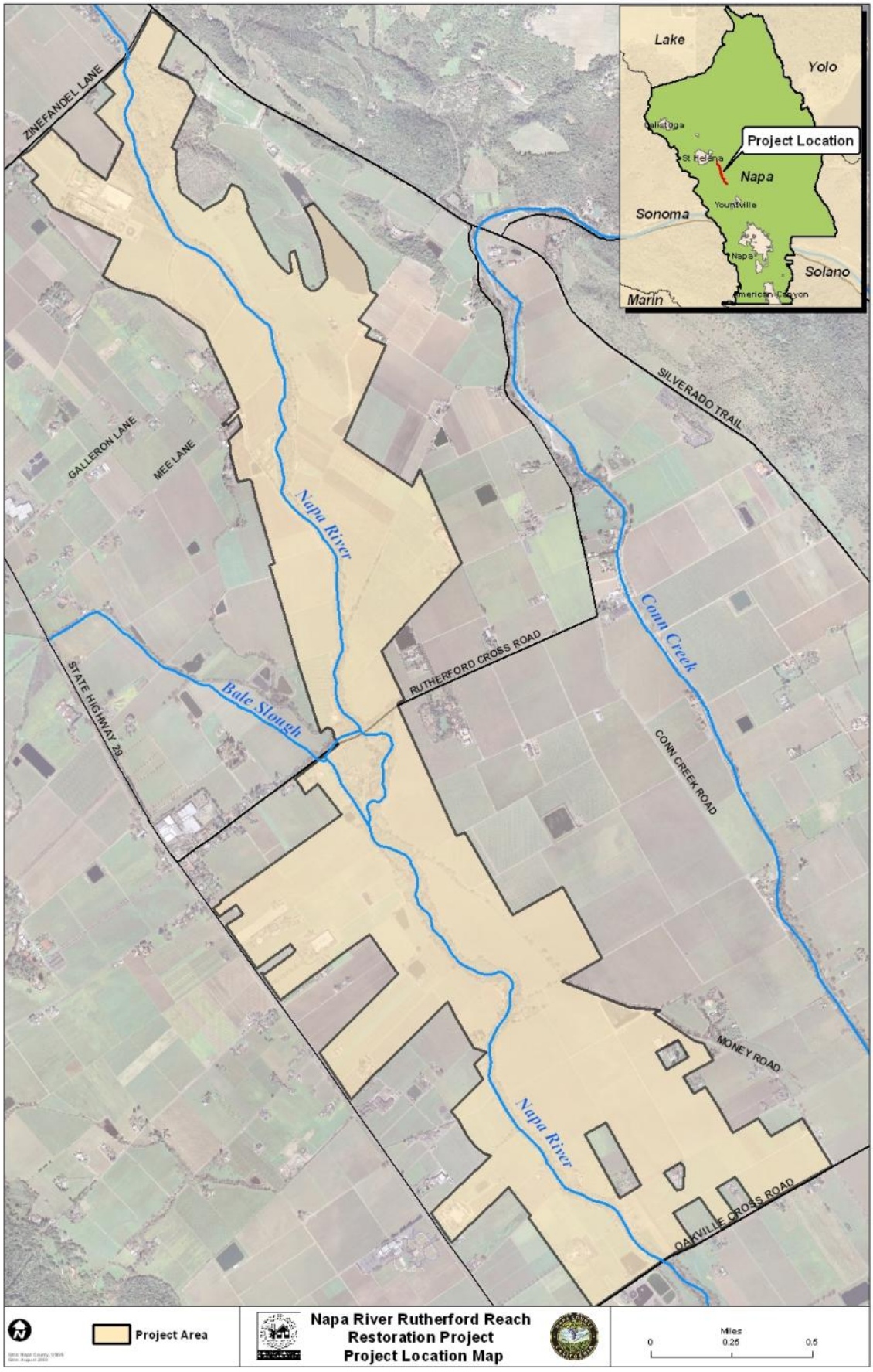


Figure 2: LWD, Trash and Debris Map

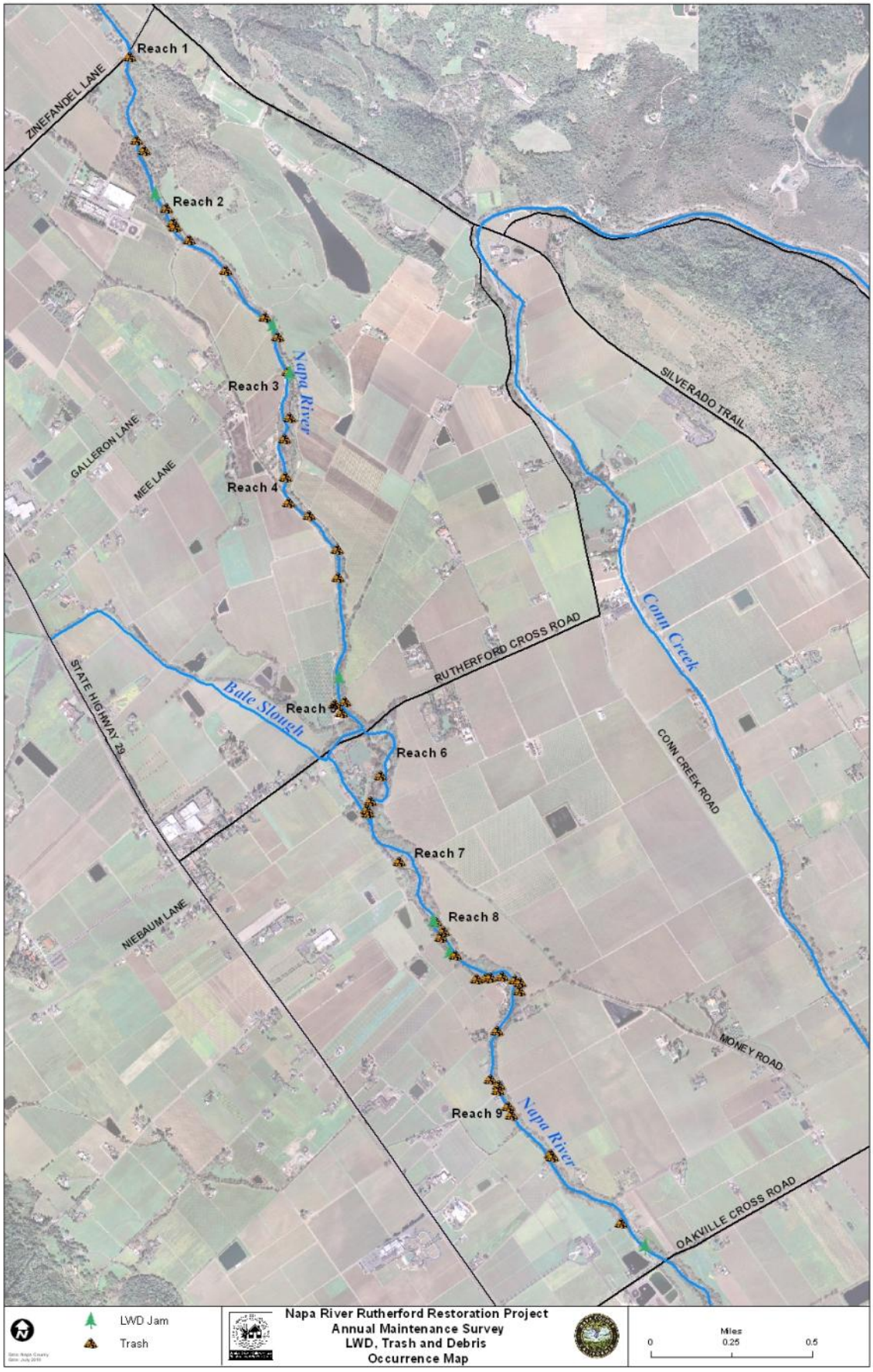
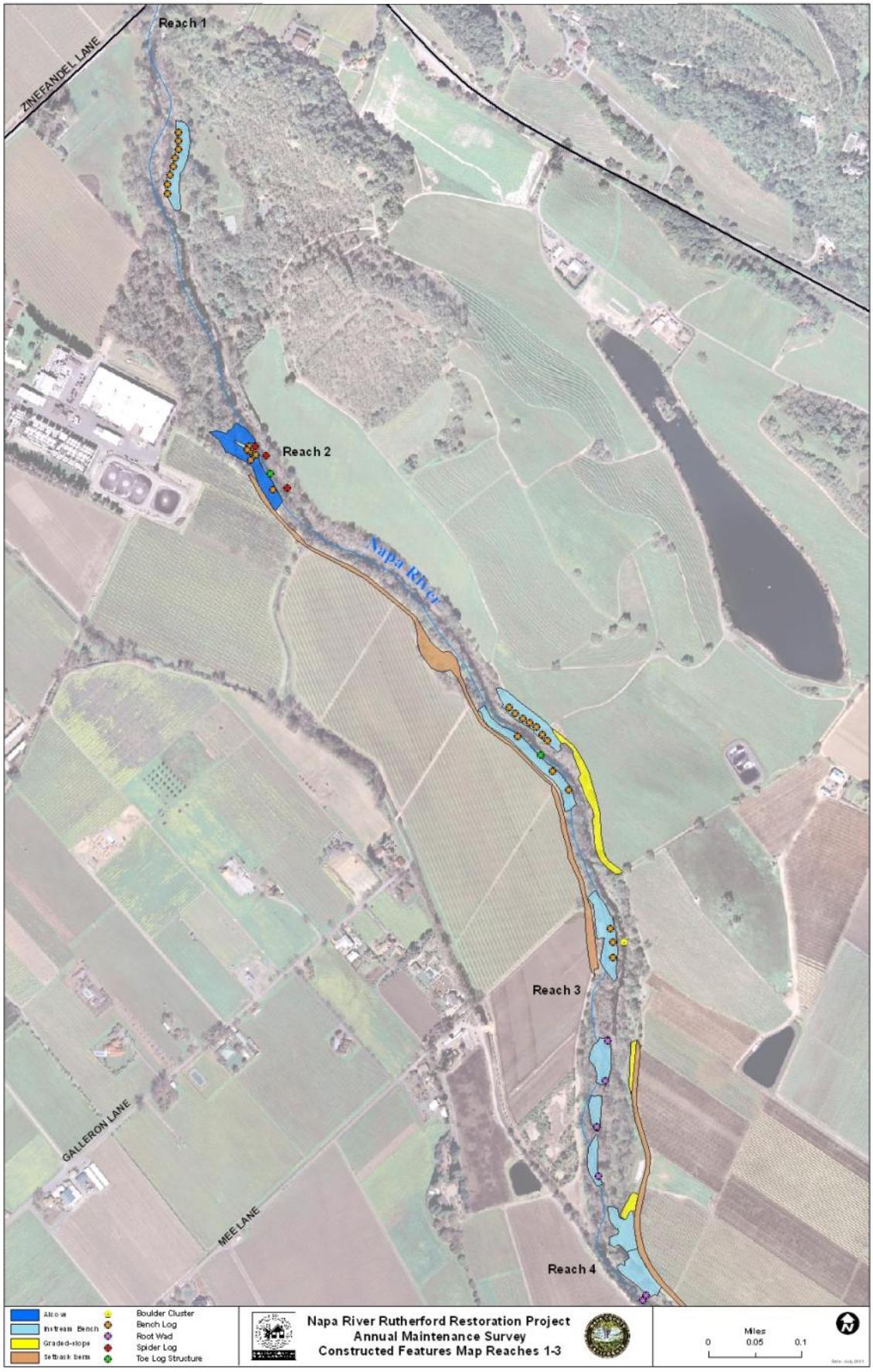


Figure 3: Invasive Plant Occurrence Map

Figure 4: Constructed Features Map



RUTHERFORD DUST NAPA RIVER RESTORATION TEAM
LANDOWNER REQUEST FOR RIVER MAINTENANCE

INTRODUCTION
The Rutherford Dust Napa River Restoration Project entails an annual survey to identify river maintenance problems and to treat priority sites. The purpose of this form is to provide Rutherford Dust Restoration Team (RDRT) members, including riverside landowners and managers, a way to record and identify issues on their properties for evaluation and potential treatment by the maintenance team comprised of RDRT and the Napa County Flood Control and Water Conservation District.

Four kinds of problems can be treated under our maintenance permit:

1) Pierce's disease host plant and other noxious weed infestations
2) Accumulated trash or debris
3) Downed trees and woody debris
4) Erosion of constructed bank protection structures

By providing your contact information and a brief summary of maintenance problems via this form, you will be submitting your request for consideration by the RDRT team, which will in turn contact you for a visit to evaluate the site.

REQUEST CONTACT INFORMATION

NAME_____ PROPERTY_____

CONTACT FOR SITE VISIT_____

PHONE_____ email_____

RIVER MAINTENANCE ISSUE
Provide a brief summary of your river maintenance concern. Identify the category of problem(s) (from above), approximate location, any time constraints on treatment, and any related issues.

_____
_____
_____
_____

FOR CONSIDERATION, PLEASE RETURN BY JULY 30, 2011
via mail or email to:

Jeremy Sarrow, Napa River Maintenance Coordinator
Napa County Water Conservation and Flood District
804 First Street, Napa, CA 94559
Email: Jeremy.Sarrow@countyofnapa.org phone: 707-259-8204