Napa River Rutherford Reach Restoration Project
Annual Maintenance and Monitoring Survey


Napa River June 2013

July 2013

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

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Background:

The maintenance program for the Napa River Rutherford Restoration Project (Project) was developed by the Rutherford Landowner Advisory Committee (LAC) and the Napa County Flood Control and Water Conservation District (District) to support the Project and to guide implementation of routine maintenance activities within the Rutherford Reach of the Napa River. The maintenance program was developed to balance the needs of landowners while protecting and enhancing the natural resources of the Napa River. As a result, landowners formed the Rutherford Dust Napa River Restoration Team (also known as "RDRT") and worked with Napa County and its affiliate agencies to design and implement a comprehensive reach-scale restoration project known as the Napa River Rutherford Reach Restoration Project. The Project area is comprised of privately-held property 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 balances the needs of local landowners with protection and enhancement of the river's natural resources. For further details regarding the maintenance program 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).

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 initial maintenance recommendations of the fourth annual stream survey conducted between June 3rd and June 6th, 2013.

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 removal of invasive non-native and Pierce's disease host vegetation, management of emergent (young) in-channel vegetation, and planting for erosion control management;
- installation of erosion control fabric or coir logs, willow pole cuttings;
- maintenance of constructed features including floodplain benches, vegetative buffers, aquatic habitat enhancement structures, and bank stabilization structures.

From 2009-2012 river restoration construction had been completed from Reach 1 through Reach 4, as well as at the upstream end of Reach 8. At the time of the 2013 survey, constructed restoration elements included 20 inset flood plain benches, 1 backwater alcove, and 7 bank stabilization areas. A total of 52 instream habitat structures had been installed: 47 root wad and bench log structures, and 5 boulder clusters. In Reaches 2-4, over 2.4 miles (1 mile east bank/1.4 miles west bank) of agricultural berms were setback in order to increase riparian habitat width (Figures 4 and 5). The focus of the 2013 stream survey included assessing the functionality of these features in addition to the regular activity 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, but are tracked for monitoring purposes, will be reported on in a separate, detailed habitat monitoring report relative to their habitat value and functionality.

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, irrigation lines, 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 high priority invasive and Pierce's disease host plants 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 Trimble GPS enabled 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, LWD Function, 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)

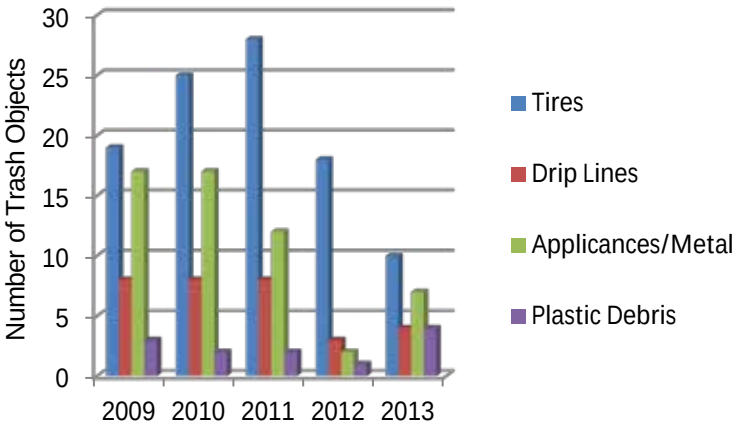
Survey Results:

The annual stream survey was conducted between June 3rd and June 6th; typical weather conditions included sunny to partly overcast skies with 0-30% cloud coverage and air temperatures ranging 65° - 75° Fahrenheit. Average water temperature ranged between 59° - 66° Fahrenheit, stream flow measured at the USGS stream gage (ID#11456000) at the Pope Street Bridge, located approximately 1100 feet upstream the beginning of the Project reach ranged from 1.7 – 2.1 cubic feet per second (cfs). Stream flow was abnormally low due the fact that significant precipitation (1" >) had not fallen in the Napa River watershed since December 2012. 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, beaver dams, eroding stream banks and potentially erosive large woody debris jams located in-channel.

Trash and Debris:

A total of 25 occurrences of trash and debris (Picture 1) were documented in the Project area with the dominant trash and debris type being tires (10 occurrences), see Picture 1, and the remaining 15 occurrences of trash and debris being various objects including irrigation drip lines, plastic containers, tarps and metal objects. This represents a significant decrease in the amount of trash and debris documented and removed from the four prior maintenance surveys. By contrast, the lowest number of trash occurrences documented in 2011 was 48 significant items. Figure 2 shows the location of the trash and debris documented. Graph 1 below represents the amount and types of trash documented during the stream survey and depicts the general long-term trend of a decrease in trash and debris found in the river.

Graph 1: Trash and Debris



Picture 1: Trash and Debris

Invasive Non-Native and Pierce Host Plants:

A total of 72 occurrences of invasive non-native plants were identified, 33 of which were Pierce host plants, and will be targeted for treatment within the Project area (Figure 3). As in previous surveys, Giant reed, Himalaya blackberry, periwinkle (*Vinca sp.*), poison

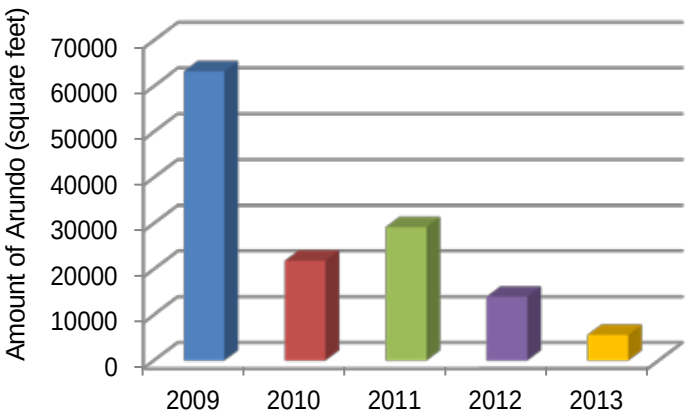
hemlock and native and hybridized grape species were the dominant target plants identified; other target species documented include tree-of heaven and red sesbania but were limited. Species such as poison hemlock, fennel, etc. were observed but not quantified during the survey as a result of land owner's requests in previous meetings to focus on and use funds for treatment of only invasive plant species that are considered Pierce host's species or priority invasive non-native species.

A total of 55,321 square feet (sqft) of non-native invasive and Pierce host plants was documented including 42,688 sqft of Himalaya blackberry, 5,662 sqft of giant reed and the remaining 6,971 sqft being a combination of native/non-native grape, periwinkle and sesbania. It is important to note that there are additional occurrences of grape, periwinkle and other Pierce host plants present beyond the river's top of bank, out of view of the in-channel river survey; therefore it is recommended that landowners contact the maintenance lead with any requests for management of invasive and/or Pierce host plants in the riparian zone beyond the top of bank that may be missed during the channel survey.

Previous and ongoing efforts to manage and remove giant reed (Arundo) have been successful in significantly reducing the amount of giant reed in the entire Project area. Graph 2 below depicts the general decline of Arundo throughout the Project area. Many of the eroding banks where Arundo has been cleared has been, or is planned to be, treated as part of the river restoration project. Currently, only small or re-sprouting patches require treatment under the Maintenance Assessment District.

Additional non-native invasive plants and Pierce host plant treatment is currently taking place in Reaches 1 though 4 and 8 under the post construction re-vegetation maintenance contracts (Picture 2). Species currently being removed include Himalaya blackberry, periwinkle (*Vinca sp.*), giant reed, poison hemlock, tree off heaven and native and/or hybridized grape species. In limited instances Mugwart (*Artemisia douglasiana*), a native species that hosts Pierce Disease bacteria, has been managed pursuant to specific landowner requests.

Graph 2: Arundo mapped and treated (2009-2013)



Picture 2: Annual weed mowing/invasive plant abetment

Table 1 summarizes the invasive non-native and Pierce host plants documented during the 2013 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*	5,662	No	High
CA & Hybrid Grape & Periwinkle	*Vitus sp., Vinca major*	6,971	Yes	None/Moderate
Himalaya Blackberry	*Rubus armeniacus*	42,688	Yes	High
Total		**55,321**		

Large Woody Debris (LWD):

A total of 200 large woody debris (LWD) structures and boulder clusters were documented and evaluated during the 2013 stream survey, 115 of which were naturally recruited LWD (minimum size: one foot diameter and six feet long); with the remaining 85 either LWD or boulder clusters structures installed as part of the restoration Project. Of the 115 naturally recruited LWD occurrences documented, 2 have been prioritized for maintenance in the 2013 work plan (thin out smaller wood, trim trunk and/or realign larger wood to reduce flood potential or erosion) (Table 2, Figure 2). As previously reported at the Spring 2013 LAC meeting, following high flow events on November 30th and December 23rd, two debris jams in Reach 8 (Sequoia Grove) were thinned out (twice) that required considerable resources to remove. As part of the Reach 8BC construction activities this year, the contractor will salvage suitable pieces of wood from the LWD debris jam at Sequoia Grove to utilize in the creation of in-stream habitat structures. The remaining 113 naturally recruited LWD occurrences that were surveyed function as important in-stream fish habitat and do not require maintenance. The distribution, habitat function and accumulation trends of all 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 significant backwater formation.
- Extent of LWD mass relative to cross-sectional stream channel area (i.e. extent of channel blockage/hydraulic radius).
- Location relative to planned Project features that provide opportunity to re-use LWD in construction.
- Landowner priority.

Table 2: LWD identified for maintenance, monitoring or treatment

River Station/Reach	LWD feature	Recommendation	Notes
228+20 (Reach 1)	Large single trunk alder, center channel, root wad diverting flow into right bank	Maintenance Recommended	Treatment – remove large limbs, leave trunk, to increase channel flow capacity, minimize root wad surface area
65+00 – 63+50 (Reach 8)	Large wood accumulation/jam (>10), west channel	Maintenance Recommended	Treatment – large wood to be incorporated into Reach 8B/C project construction as in stream habitat structure. This debris jam was also thinned out in February and March of 2013

Installed LWD Structures and Constructed/Graded Benches

As mentioned previously, at the time of this survey, construction has been completed through Reach 4 and the upstream end of Reach 8 , resulting in the installation of 20 flood plain benches and 1 backwater alcove, 47 rood wad and bench log structures and 5 boulder clusters . At the time of the survey, all LWD and boulder cluster structures that were able to be located appeared to be functioning as designed and will not require maintenance in 2013. However, 2 LWD structures and 1 boulder cluster were not able to be located and are presumed to be buried, but will likely be revealed in future years by high stream flow scour when they will regain habitat value.

Additionally, the LWD structure that was thinned adjacent to the instream bench repaired in 2012, in Reach 2, on The Ranch Winery property appears to be holding up well. To date, the root wad placed at the scour hole has remained in place and has arrested further bank erosion by providing a bio-technical solution for bank stabilization.

In the newly constructed Reach 4, west bank, and Reach 8 sites, the downstream and upstream ends of several of the floodplain benches, where graded areas transition to unaltered slopes, experienced scour and erosion related to the December 2012 high stream flows. Those transition areas were replanted willow and cottonwood stakes and rebuilt with vegetated soil lifts (VSL) in March of 2013 and appear to be growing and holding well (Picture 3).

As previously mentioned, there are additional areas of localized bank erosion related to the previously treated Arundo sites (Picture 4) that the District intends to address/stabilize using a combination of bio-technical methods such as those utilized above in the fall of 2013. See Table 3 for the location and details of the proposed bank stabilization work to be conducted at these sites.

Picture 3: Reach 8 erosion repair site (March 2013)

Picture 4: Arundo treatment site showing bank erosion

Table 3: Proposed bank stabilization sites at Arundo treatment areas

River Station/Reach	Property	Proposed Work
191+75 (Reach 2)	Frogs Leap	Remove dead Arundo stalks and excavate root mass where feasible. Cover exposed areas of soil with erosion control fabric, straw wattles and erosion control jute net, seed mix in Fall and plant with live willow stakes.
156+50 (Reach 4)	Emmolo Vineyards	Remove dead Arundo stalks and excavate root mass where feasible. Cover exposed areas of soil with erosion control fabric, straw wattles and erosion control jute net, seed mix in Fall and plant with live willow stakes; possible brush mat.
142+80 (Reach 4)	Caymus Vineyards	Remove significant stand of dead Arundo stalks and excavate root mass where feasible. Cover exposed areas of soil with erosion control fabric, straw wattles and erosion control jute net, seed mix in Fall and plant with live willow stakes; possible brush mat.
29+50 (Reach 9)	Laird	Will be treated as part of Reach 9, east bank, 2014 construction and re-vegetation work.

Landowner Requests for Maintenance

Table 4 below lists landowner maintenance requests received, either verbally or by written form, by the District at the time of drafting this report. The District has all ready begun conducting the requested work and expects to complete these tasks by late fall 2013. Additionally, the District would like to remind landowners that maintenance requests are accepted, and work will be considered, throughout the year. A copy of the landowner maintenance request form is included at the end of this report. Table 4 below details the specifics of the landowner requests received thus far for the 2013 maintenance season.

Table 4: Landowner Maintenance Requests received to date for maintenance year 2013

River Station/ Reach	Property	Requested Work	Recommendation
238+00 (Reach 1)	Guggenhime	Remove compromised drip irrigation lines, mow fire break at top of bank and inspect possible bank erosion at base of bench cut.	Completed requested work. Drip line removed, fire break mowed at time of spring weed abatement work. The bank erosion area was assessed and deemed not significant enough to warrant use of Maintenance Assessment District resources at this time
210+00 (Reach 2)	Frogs Leap	Install additional understory and over story vegetation at managed retreat area behind berm from 213-00 to 206+00.	Additional understory and over story vegetation to be installed in fall of 2013 pending landowner's approval of District suggested planting pallet.
195+00	Quintessa	Mow fire break at top of bank,	Fire break mowed at time of spring weed abatement

(Reach 2)		remove/treat select Pierce host vegetation.	work, select Pierce host vegetation currently being treated.
93+00 (Reach 6)	St. Supéry Winery	Mechanically removed poison hemlock and Vinca, streamside and top of bank.	Landowner requested conducting the work themselves under the Districts guidance and permit. Request was granted and work was completed spring 2013 and will continue annually in the spring and summer as needed.

Recommendations and Work Plan:

The RDRT maintenance survey team recommends the following work be conducted during fiscal year 2012-2013:

- 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 and/or root wads at LWD jams (<12-inches-in-diameter and/or <6-feet-long) adjacent to landowners property as recommended by survey report (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; this task also includes appropriate re-vegetation planting/seeding and irrigation of treatment of sites where treatment has left significant gaps in the riparian under story canopy.
- Repair and stabilize exposed stream banks at *Arundo* treatment sites as outlined in Table 3. Additionally, more comprehensive bank stabilization measure will be implemented at one of these sites once Project construction related commence during the summer of 2014.
- Complete outstanding maintenance work requested by landowners that has not been completed to date; continue to respond to maintenance requests for landowners through the calendar year.

A more detailed work plan with the proposed maintenance work for 2013, 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 at a meeting scheduled for July 25th 2013 and will be available for comment to all landowners participating in the Project as well as engaged regulatory agencies. After completing the review, evaluation and prioritization of the annual maintenance report with the LAC and regulatory agencies, maintenance activities outlined in this report will begin and likely extend through December 2013. This 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.

Monitoring Requirements

Post-construction and periodic monitoring surveys are required in order to track indices (such as rates of channel incision and bank erosion) that will help ensure that Project Goal and Objective are being met or on track to being achieved. Following the high river flows ("channel forming flows") experienced during the winter of 2012, a long profile channel survey is now required (per project monitoring documents and permits) that measures physical change in the river channel bed as a result of these high flows; this survey is required approximately once every 5 years or following a "channel forming flow" event. The cost of this once every five year survey is approximately $18,500 and is reflected in the Annual Survey Task and Total Expenditures details outlined below in Table 5.

Estimate of Cost/Fund Balance:

A draft cost estimate to complete maintenance and monitoring tasks for fiscal year 2013/2014 using funds generated from the annual assessment know as the Rutherford Reach Benefit Zone - Assessment District 2008-01 is provided in Table 5. Table 5 also includes an accounting of funds spent to date by fiscal year as well as the remaining fund balance. It is anticipated that maintenance tasks will be conducted by the Napa County Flood Control and Water Conservation District and contractors. A revised final budget that more accurately reflects the expenditures for fiscal year 2014 will be issued in the spring of 2014.

Table 5: Estimated cost to complete maintenance work for fiscal year 2014 and fund balance by fiscal year

	Annual Expenditures by Fiscal Year (FY)						
Task	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY2014
Annual Surveys & Development of Work Plans, Report and Monitoring	0	20,954	37,495	27,440	28,008	16,201	34,701
Trash Removal & Disposal Fees (Napa County Waste Management)	0	0	2,144	2,144	3,013	120	240
Invasive Plant/Weed Management	0	1,320	8,027	8,479	10,519	12,722	13,500
LWD Thinning and/or Removal	0	0	1,760	1,496	2,867	17,913	8,950
Habitat Structure Maintenance/Re-vegetation/Erosion Repair	0	0	0	1,320	3,995	2,642	11,744
Field Equipment, Supplies, Administration, Misc.	0	314	826	392	875	175	500
Engineers Report/Public Notice/Legal	0	23,933	1,655	1,655	1,655	1,655	1,655
Total Expenditures	**$11,250**	**$46,521**	**$51,907**	**$42,926**	**$50,932**	**$51,428**	***$71,290**
Remaining balance	$0	$90,389	$47,728	$56,484	$48,291	$46,732	**$26,870
Cumulative Fund Balance (with interest) to date	****$316,494**						

* Estimated expenditures for FY 2013/2014 including encumbrances *and longitudinal survey ($18,500) required every 5 years to monitor channel incision* rate.
** Assumes full assessment of 98,160 collected

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; 2013. USGS Real-Time Water Data Web Site for stream gage #11456000 accessed on 06-27-2013: http://waterdata.usgs.gov/nwis/uv?11456000

Stream Survey Team

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Report Production

Jeremy Sarrow, Watershed & Flood Control Resources Specialist, NCFCWCD

Figure 1: Project Location Map

Figure 2: LWD, Trash and Debris Map

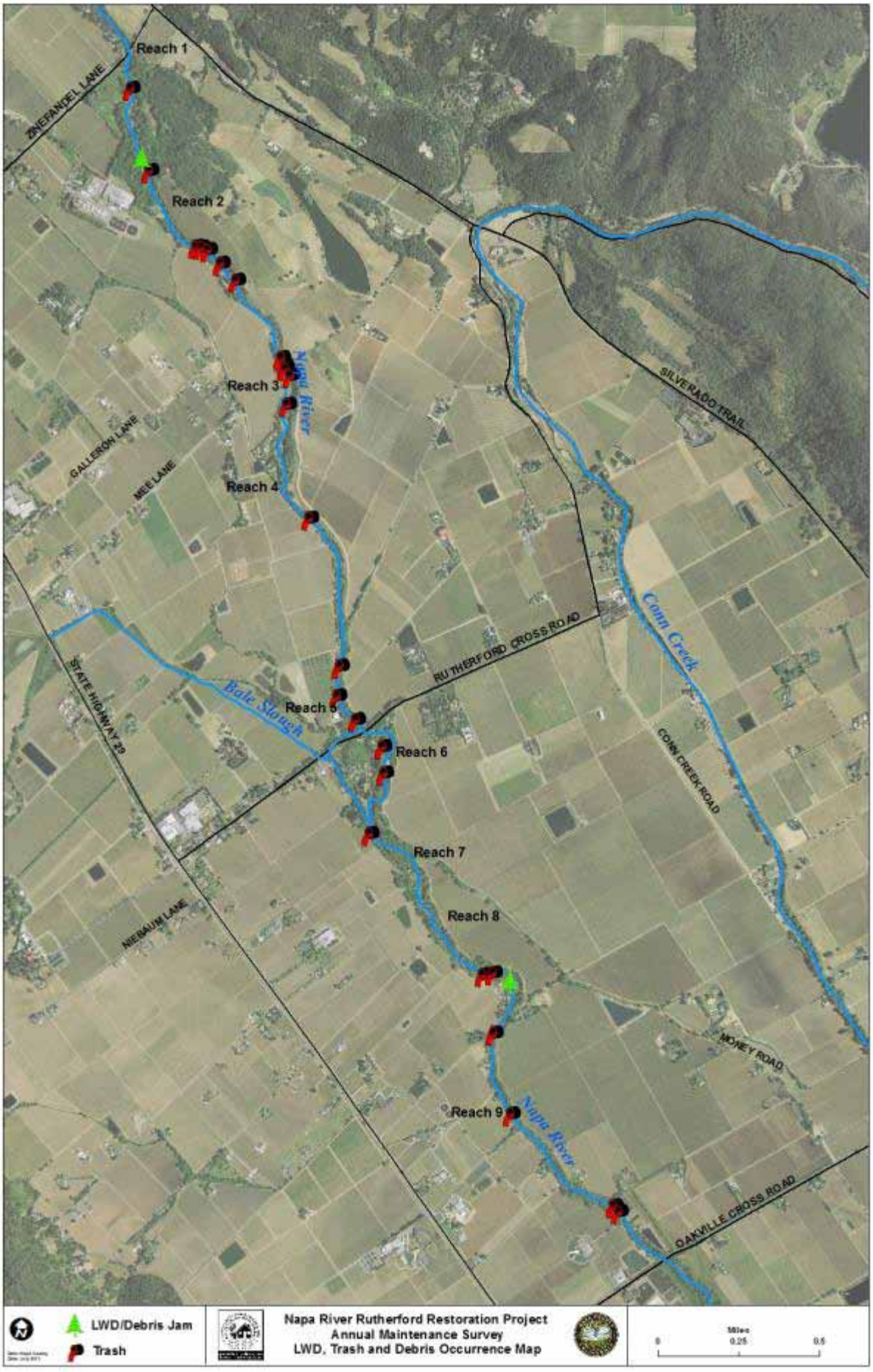
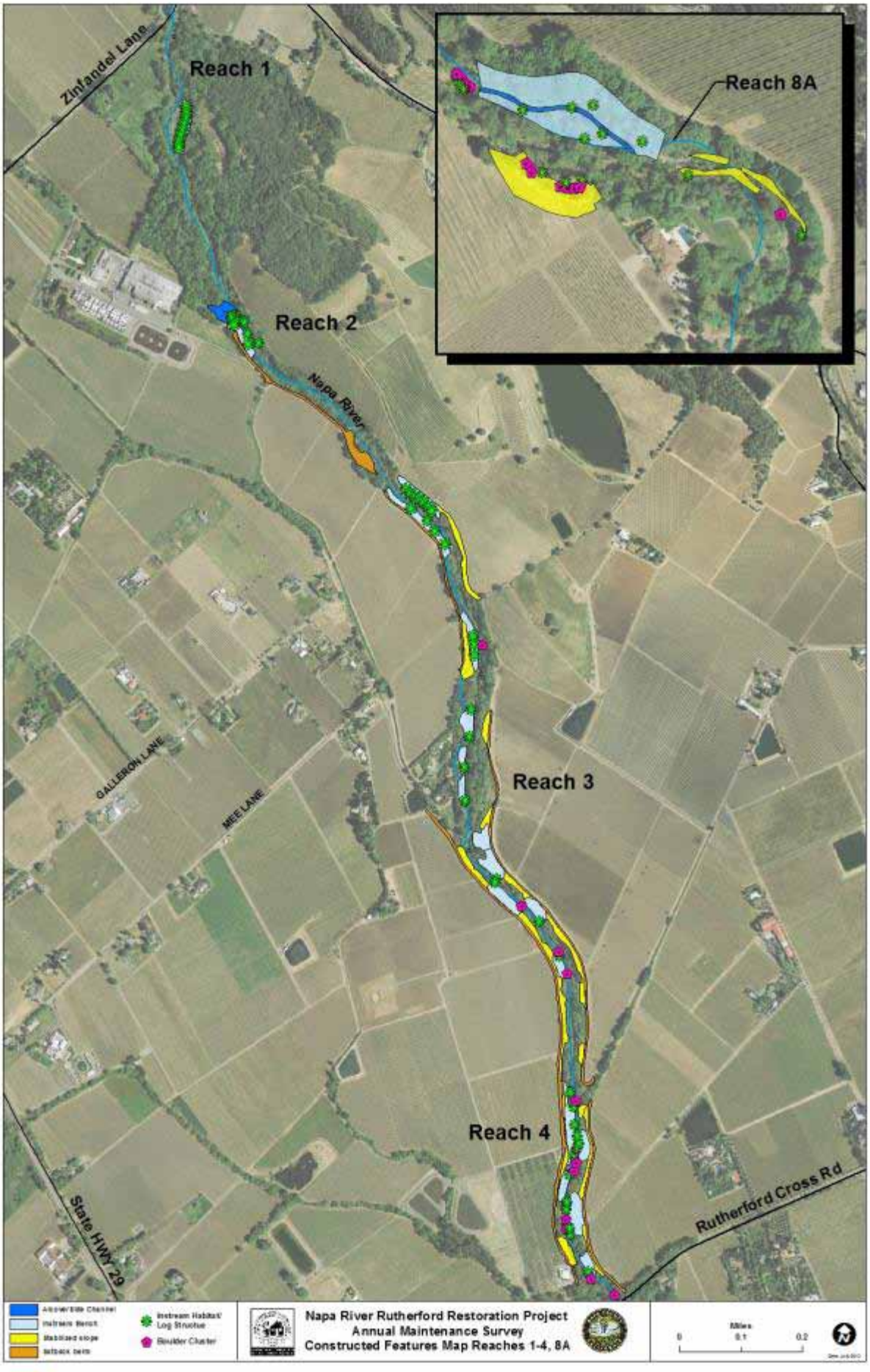


Figure 3: Invasive/ Pierce Host Plant Occurrence Map

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, 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