Napa River Rutherford Reach Restoration Project
Annual Stream Maintenance Survey

Reach 9 Bank Stabilization Site

June 2018

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

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1.0 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 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) 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 (Survey) to identify and assess issues of maintenance concern and monitor Project resources. 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 Survey conducted during the summer of 2018.

River restoration construction activities were completed in the fall of 2014 and the Project is now in the maintenance and monitoring phase. For monitoring and maintenance tracking purposes the 4.5 mile Project reach has been divided into sub-reaches numbered from 1 to 9 starting from the Zinfandel Lane Bridge and ending at Oakville Cross Road. As a result of construction and completion of the Project in 2014, 26 floodplain benches measuring a total of 8,580 linear feet were constructed in Reaches 1-9. A total of 6 side channel, wetland and alcove features were built including the secondary channels constructed at the Round Pond and Wilsey Properties and the backwater alcove features constructed at Rutherford Wine Studios and Cakebread properties. 13 bank stabilization areas were constructed and approximately 14,303 linear feet of setback berms were created in order to widen the distance between agricultural activities and the river channel.

As in previous surveys the focus of the 2018 stream maintenance survey included identifying and documenting target invasive and Pierce Disease host plant species, potentially erosive LWD accumulations, active bank erosion sites and accumulated trash or debris needing removal form the channel. The annual stream maintenance survey was conducted between May 21st and May 29th , 2018; typical weather conditions included sunny to partly cloudy skies with 10%- 25% cloud cover and air temperatures ranging between 53° - 68° Fahrenheit. Stream flow measured at the USGS stream gage (ID#11456000) at the Pope Street Bridge, located approximately 1,100 feet upstream of the Project reach ranged from 1.3 – 7.5 cubic feet per second (cfs).

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 include:

- Debris (trash, etc.) 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.

1.1 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. Depending on the monitoring year 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. The

additional monitoring data collected is presented in a separate annual monitoring report. A team of resource specialists including an ecologist, fisheries biologist and hydrologist conduct the survey with assistance from District interns.
The essential aspects of the annual stream survey are:

- Identify and prioritize maintenance actions, including vegetation management, large woody debris (LWD) realignment and/or relocation, debris (e.g. tires, 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.

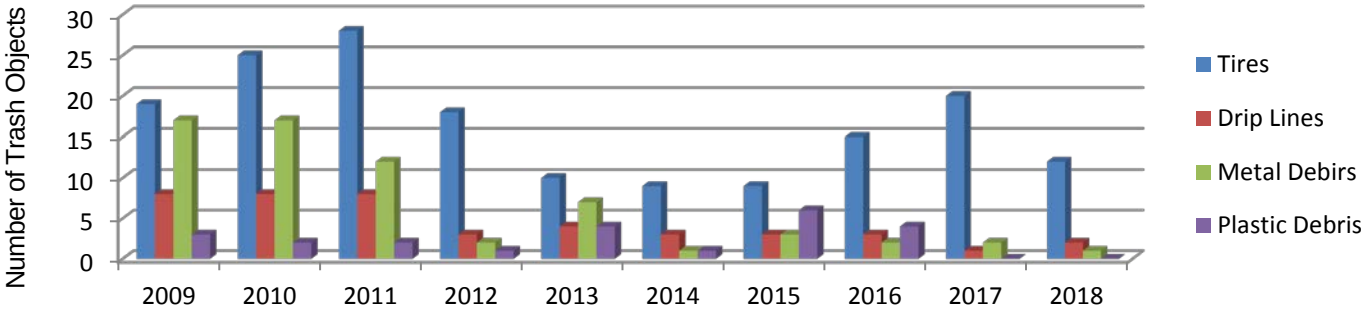
For further details regarding parameters measured please refer to the monitoring and maintenance plans prepared for the Project; both can being view and downloaded from the Napa Watershed Information and Conservation Council (WICC) http://www.napawatersheds.org/app_folders/view/3577.

2.0 Results

Trash and Debris:

15 significant occurrences of trash and debris were documented in the Project area. **Graph 1** Illustrates the number and types of trash documented during the stream survey. Since surveys began in 2009, tires have consistently been the dominant trash type documented in the channel; this year 12 of the 15 trash occurrences were tires. The remaining three (3) items included a mattress box spring and drip irrigation lines. **Figure 2** shows the location of the surveyed trash and debris.

Graph 1: Trash and Debris (2009-2018)



2.1 Invasive Non-Native and Pierce Host Plants

Figure 3 at the end of the report depicts the location of significant occurrences of invasive and Pierce host vegetation that was documented during the 2018 survey. Himalayan blackberry, native and hybridized grape and Mugwort were the dominant target plants identified for management; other target species documented included giant reed (*Arundo sp.*), Periwinkle (*Vinca sp.*), black locust and red sesbania but were limited in distribution. Invasive 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 plants that are considered Pierce host's species or priority invasive non-native vegetation.

A total of 86,145 square feet (1.56 acres) of non-native invasive and Pierce host vegetation was documented during the 2018 survey. Species documented in 2018 include 17,800 sqft of Himalayan blackberry, 45,000 sqft of native/hybrid CA grape, 5,000 sqft of vinca, 17,500 sqft of mugwort and 845 sqft of Giant reed. As in previous years, we encourage landowners to contact maintenance staff with any additional requests for management of invasive and/or Pierce host vegetation in the riparian zone beyond the top of bank that may have not been documented during the channel maintenance survey. Management of the surveyed non-native invasive and Pierce host vegetation has already begun and will continue through the end of summer 2018.

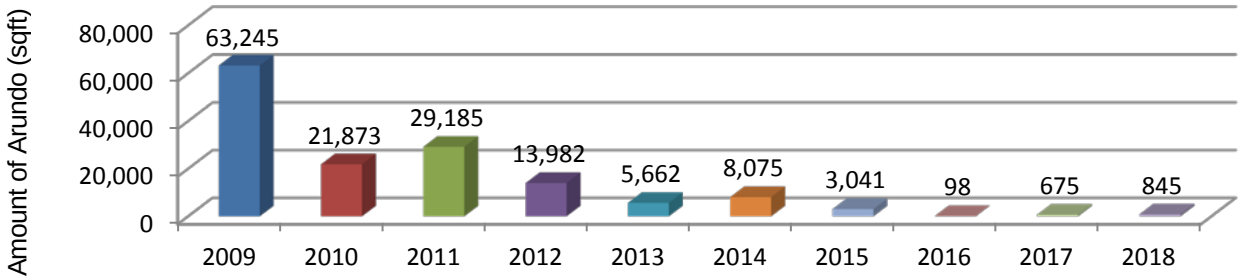
Table 1 below summarizes the invasive non-native and Pierce host plants documented during the 2018 stream survey. Further, **Table 1** lists if the species is a Pierce Disease host and ranks each species as a "high" or "moderate" impact invasive species as defined by the California Invasive Plant council (Cal-IPC); the Cal-IPC list primarily includes plants exhibiting some level of invasiveness in native habitats. A revised table will be included in the spring 2019 final maintenance memo reflecting the total square footage of invasive and Pierce host vegetation treated during calendar year 2018.

Table 1: Invasive Non-Native and Pierce Host Plants documented during 2018 survey

Common Name	Scientific Name	Infested Area (SqFt)	Native?	Pierce Disease host	Cal-IPC Ranking
Giant reed	*Arundo donax*	845	No	No	High
Mugwort	*Artemisia douglasiana*	17,500	Yes	Yes	None
Periwinkle	*Vinca major*	5,000	No	Yes	Moderate
CA & Hybrid Grape	*Vitus sp.*	45,000	Yes/No	Yes	None
Himalayan Blackberry	*Rubus armeniacus*	17,800	No	Yes	High
Total		**86,145 (1.56 acres)**			

Previous and ongoing efforts to manage and remove Giant reed have been successful in significantly reducing the quantity within the Project area; **Graph 2** below depicts the decline of Arundo throughout the Project area since monitoring and management began in 2009. The area of Giant reed documented this year (845 sqft) was slightly more than documented in 2017 (675 sqft). This is likely do to the fact that one large new clump and se3veral re-sprouts were discovered that had previously gone undetected; all areas will be treated in the fall of 2018.

Graph 2: Arundo mapped and treated (2009-2018)



2.2 Stream bank erosion and woody debris (LWD) jams

Four new bank erosion (**Picture 1**) sites were documented during the survey; the District intends to stabilize 1 of the 4 erosion sites utilizing a combination of bio-technical methods (brush mattress) during the fall of 2018 while the remaining 3 sites only require the planting of willow poles and alder saplings at the base of the eroding bank in order to recruit sediment at the toe of the erosion area and arrest any further bank retreat. See **Table 2** for the location and details of the proposed bank stabilization work to be conducted.

Table 2: Proposed bank stabilization sites

River Station/Reach	Description	Proposed Work
230+00 (Reach 2)	Bank Erosion Site, un-vegetated at toe	Plant toe of bank with live willow stakes and alders in fall.
197+50 (Reach 3)	Bank Erosion Site, mid-bank high flow scour	Rebuild exposed top/mid slope of bank and fabricate live willow brush mattress.
82+50 (Reach 7)	Undercut bank, several cottonwoods undermined	Supplement existing cottonwood saplings at toe of bank with live willow/cottonwood stakes and alders in fall.
49+25 (Reach 8)	Bank Erosion Site, un-vegetated at toe	Supplement existing cottonwood saplings at toe of bank with live willow stakes and alders in fall.

Picture 1: Bank Erosion Site Reach 3

Picture 2: Beaver Dam Reach 4

Only 1 LWD occurrence in reach 8 (**Figure 2**) was identified during the Survey that was consider significant enough to require management actions. County staff will thin out/remove significant tree trunks in channel at this area in order to restore high flow conveyance and prevent potential bank erosion on adjacent right bank.

Previous surveys documented significant levels of beaver activity (dam building, downing of trees) within the Project reach of the Napa River; in 2016 for instance the District documented thirteen active beaver dams. However, it appears that high stream flows from the 2016/2017 winter not only removed all beaver dams documented in the summer of 2016 but only two (**Picture 2**) beaver dams were noted during the 2018 summer survey. In general, the District does not consider beaver dams to be an issue that would cause bank erosion or localized flooding; the dams are insignificant relative to the river channel and typically wash away each winter (as demonstrated in 2017). During the low flow season, the dams impound slow water, providing cool, pool habitat for aquatic wildlife. However, if a particular dam does appear to present a hazard the District will manage the area appropriately by thinning out the structural wood of the dam to allow for sufficient flow and debris conveyance.

2.3 Irrigation and Vegetation Maintenance

The Maintenance Assessment District (MAD) has now assumed responsibility and costs for all restored areas. The District now has full maintenance responsibility for Reaches 1-9 (approximately 30.5 acres). Tasks once paid for under the three year maintenance contracts such as mowing, invasive/Pierce host vegetation management, watering, mulching, etc. are now all paid for under the MAD. General vegetation maintenance, Pierce host plant removal and periodic watering at these restored sites is conducted as needed to ensure that the restored areas are being sufficiently maintained for their habitat value and PD host plants are suppressed. In general, sites that have been planted and established for more than three years (all sites in Reaches 1-4 and 8) will no longer receive supplemental watering as the California native plants installed have adapted to the natural hydrologic patterns for the region.

2.4 Landowner Requests for Maintenance

In additional to the regular maintenance work (invasive/Pierce host plant management, irrigation, LWD management, etc.) that takes places throughout the entire 4.5 mile Project reach landowners are encouraged to contact the District directly if specific tasks relative to river maintenance are desired that are not part of the routine maintenance conducted annually. Several specific requests from landowners have been received by the District to conduct specific riverside property maintenance tasks. The District has already begun conducting work pursuant to this report as well as specific landowners requests submitted to the District either verbally, via email or by phone. Additionally, the District would like to remind landowners that maintenance requests are accepted throughout the year. A copy of the channel maintenance request form is included at the end of this report.

2.5 Recommendations and Work Plan:

Pursuant to this Report, the RDRT maintenance survey team recommends the following work be conducted in 2018:

- Remove of all trash and debris from the stream channel that can be readily accessed and accomplished with hand labor, pulley or winch assisted mechanisms,
- Remove/this/realign the LWD jam with Reach 8,
- Treat large accessible patches of non-native invasive and Pierce host vegetation with mechanical and chemical (glyphosate) methods including Himalayan blackberry, mugwort, vinca, California grape and Arundo; this task also includes appropriate re-vegetation and irrigation of treatment sites where treatment has left significant gaps in the riparian under story canopy,
- Repair and stabilize exposed stream bank erosion areas as proposed in Table 2,
- Conducted annual summer mowing of non-native grasses and broadleaf vegetation on constructed flood plain benches as needed,
- Complete maintenance work requested by landowners; continue to respond to maintenance requests for landowners through the calendar year,

A table providing additional site specific details (listed by property owner) of the proposed maintenance work to be conducted in 2018 will be presented for review to the landowners at the June 28th LAC meeting. After completing the review, evaluation and prioritization of the proposed maintenance work with the LAC and regulatory agencies, maintenance activities will be completed by October 15th, 2018. This report and a final summary memo of work conducted each year can be accessed and downloaded 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.

3.0 Budget:

The Maintenance Assessment District (MAD) has been in place since June, 2008 and generates annual revenues of $98,160. Funds pay for annual vegetation and debris management and maintenance work, the annual river survey, report production and periodic resource monitoring surveys to gather data against which to track changes in channel and habitat conditions and comply with Project permit. Remaining funds accumulate for future annual maintenance and monitoring work. A draft cost estimate to complete the maintenance *and* monitoring tasks for fiscal year 2018/19 using funds generated from the MAD is provided in **Table 3** below. **Table 3** also includes an accounting of expenditures for the last two fiscal years as well as the fund balance as of June 1st, 2018. Maintenance tasks will be conducted by the Napa County Flood Control and Water Conservation District and contractors. An statement of the actual expenditures for fiscal year 2018/19 will be provided in the spring 2019 final maintenance memo.

Table 5: Expenditures from past two fiscal years and estimated expenditures for fiscal year 2018/2019

Tasks	Budget Item per Engineers Report	2016/17	2017/18	Proposed 2018/19
Annual surveys & development of work plans, report, monitoring, administration	9, 10	$31,287	$28,274	$26,160*
Vegetation/ invasive plant management of floodplain benches, irrigation	2,4,5,8	$19,232	$27,513	$30,500
Streambank erosion and habitat structure maintenance	3,6,7	$0	$3,020	$7,000
Debris/LWD Thinning and/or removal	1	$880	$960	$1,000
Total expenditures		**$51,399**	**$59,767**	**$64,660**
Annual assessment balance		$47,761	$38,393	$33,500
Cumulative fund balance (with interest) 6/01/2018	**$489,894**			

*Includes Napa County and Napa Resource Conservation District services

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

4.0 References:

Jones and Stokes, August 2008. *Final Maintenance Plan for the Napa River Rutherford Reach Restoration Project*; 2015.

USGS Real-Time Water Data Web Site for stream gage #11456000 accessed on 06-05-2018: http://waterdata.usgs.gov/nwis/uv?11456000

Stream Survey Team:
Leif Bryant, NCFCWCD, Shaun Horne, NCFCWCD, Jeremy Sarrow, NCFCWCD

Report Production:
Jeremy Sarrow, Watershed & Flood Control Resources Specialist, NCFCWCD

Figure 1: Project Location Map

Figure 2: LWD, Trash and Debris Map

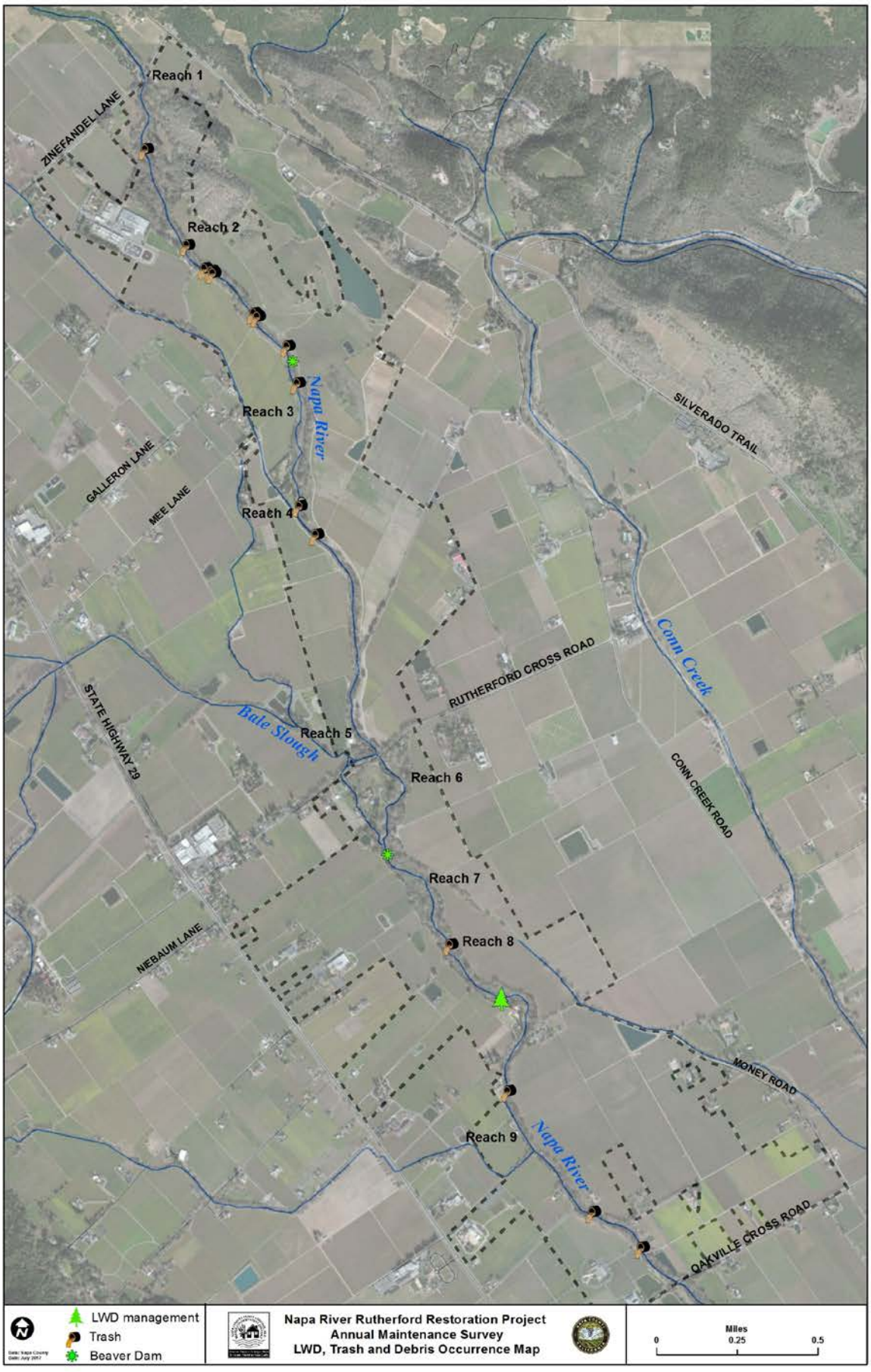


Figure 3: Invasive/ Pierce Host Plant Occurrence Map

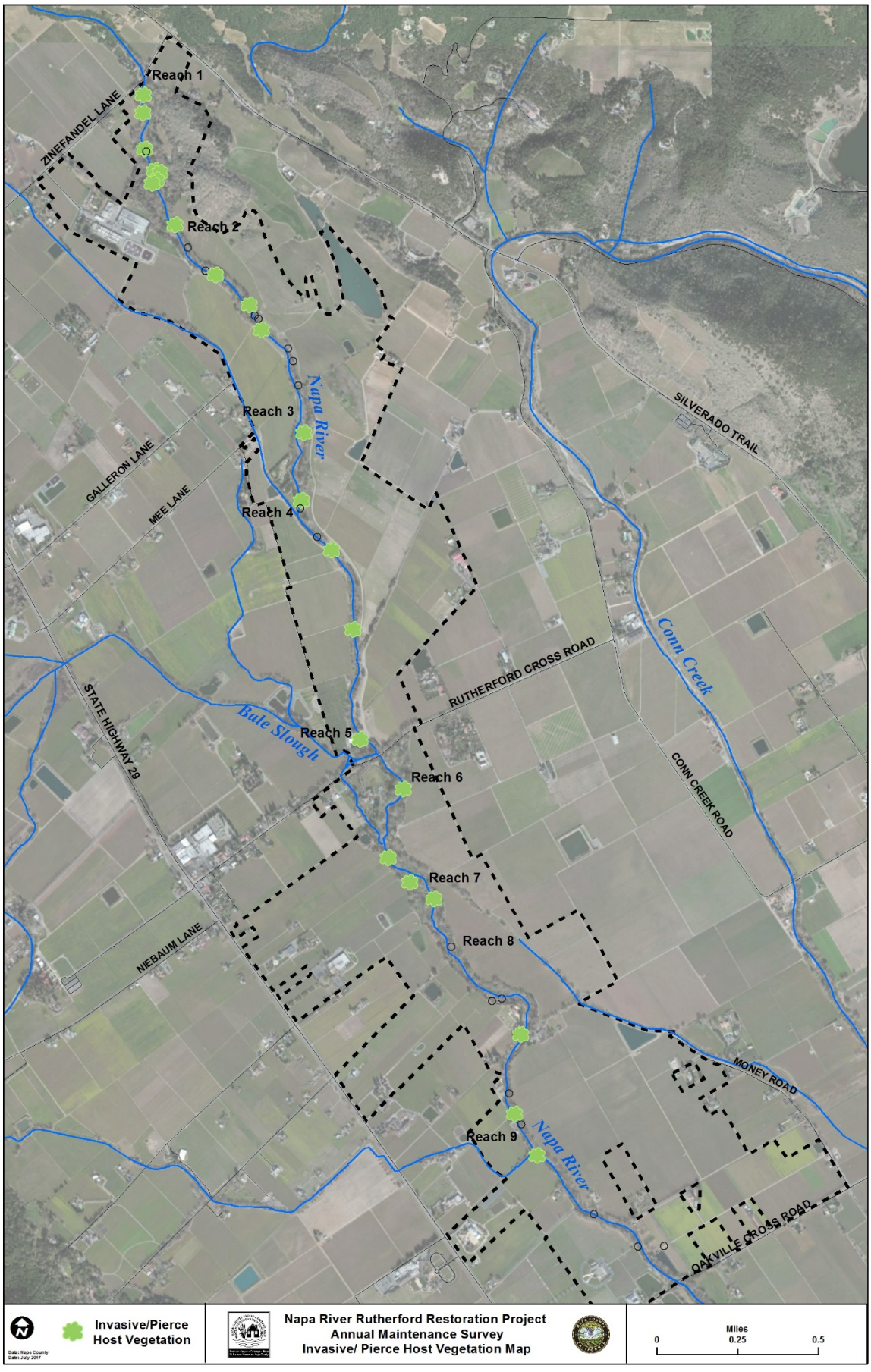


Figure 4: Constructed Features Map