WESTERN SHASTA COUNTY
INVASIVE NON-NATIVE PLANT CONTROL PROGRAM

INITIAL STUDY AND MITIGATED NEGATIVE DECLARATION

DATE: 2-8-2019

Program Title: Western Shasta County Invasive Non-Native Plant Control Program

Program Proponent:
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Program Location:

The Program is located on public and privately owned parcels within multiple watersheds in Shasta County, with some work areas in Tehama County along Cottonwood Creek which is the boundary between the two Counties (see Figure 1 – Program Area). One of the primary plants that will be treated is giant reed (*Arundo donax*). The estimated size of new *Arundo* treatment is 26.4 acres and re-treatment 7.4 acres of past treatment areas within the Program area. This *Arundo* data is based on 2017 mapping by Cal-IPC (Cal-IPC 2019), which identified *Arundo* infestation sites from aerial imagery and known treatment areas. In addition to control of *Arundo,* salt cedar (*Tamarisk* spp.), tree-of-heaven (*Ailanthus altissima),* black locust (*Robinia pseudoacacia*), scotch broom (*Cytisus scoparius*), rattlebox (*Sesbania punicia*), and pampas grass (*Cortaderia selloana*) may be treated in the Program area (reported plant distributions, Appendix 1). These species have been determined to impact native plant and animal species, habitat function, and pose a risk to public and private resources by increasing fire and flood risk.

General Plan Designation and Zoning: Zoning varies; See Table 1.

Table 1. General Plan Designation and Zoning

General Plan Designation	Zoning
Upland Agriculture	**UA Upland Agriculture**
Valley Floor Agriculture	**EA Exclusive Agriculture District**
Timber	**TPZ Timber Production Zone**
Residential	**RE Residential Estate**
General Office	**General Office**
Greenway	**Open Space**
Industrial	**M1 Light Industrial**

Purpose of Initial Study:

This document is an Initial Study/Mitigated Negative Declaration (IS/MND) for the Western Shasta County Non-Native Plant Management Program (Program). The applicant, Western Shasta Resource Conservation District (WSRCD) is proposing to control the most problematic invasive non-native plants within riparian and adjacent habitat in western Shasta County and part of Tehama County. The purpose of this IS/MND is to present an analysis of environmental consequences related to implementation of the proposed Program and to describe features and procedures incorporated into Program work that shall avoid or mitigate significant environmental effects to the environment. This disclosure document is being made available to the public for review and comment for a period of 30 days.

Availability of Document: The IS/MND is available for review on the web at the following locations:

- Western Shasta Resource Conservation District, 6270 Parallel Road, Anderson, CA, 96007
- Western Shasta Resource Conservation District, www.westernshastarcd.org
- State Clearinghouse, 1400 Tenth Street, Sacramento, CA, 95814

Questions or comments regarding this proposed Mitigated Negative Declaration may be addressed to:

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Acronyms Used

Acronym	Meaning
AFRP	Anadromous Fish Restoration Program
CADFW	California Department of Fish and Wildlife
CALFED ERP	Bay-Delta Program Ecosystem Restoration Program
Cal-IPC	California Invasive Plant Council
CARLF	California red-legged frog
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CVS	Central Valley spring-run
DPR	Department of Pesticide Regulation
EPA	Environmental Protection Agency
FESA	Federal Endangered Species Act
FWS	Fish and Wildlife Service
GHG	Greenhouse gases
HCP	Habitat Conservation Plan
HQ	Hazard Quotient
IS/MND	Initial Study/Mitigated Negative Declaration
LD50	Lethal Dose 50
LOC	Level of concern
NCCP	Natural Community Conservation Plan
NOAA	National Oceanic and Atmospheric Administration
NOAEL	No Observable Adverse Effect Level
NPE	Nonylphenol polyethoxylate
NRCS	Natural Resources Conservation Service
RCD	Resource Conservation District
ROE	Right of entry
SERA	Syracuse Environmental Research Associates
USFS	U.S. Forest Service
VELB	Valley Elderberry Longhorn Beetle
WCB	Wildlife Conservation Board
WMA	Weed Management Area
WSRCD	Shasta Resource Conservation District

Introduction and Background:

This Program will focus on the most problematic invasive non-native plants in riparian and adjacent habitat in western Shasta County and part of Tehama County. These species have negative impacts on the native flora and fauna, increase fire and flood risk, increase water consumption, and change the natural functioning of the geomorphology of the river and creeks. Two of the most problematic species in riparian areas of California are giant reed (*Arundo donax*) and salt cedar (*Tamarix* spp.). Both are very aggressive invaders, but currently are of limited distribution and abundance in the County (Figure 1, Appendix 1). *Arundo* and salt cedar are major threats to the health of riparian and

aquatic habitats in California's Central Valley, and both occur as scattered infestations within riparian areas and floodplains throughout much of western Shasta County. Eradicating *Arundo* in Shasta County will also allow control to occur downstream without the risk of re-invasion over time.

Arundo and salt cedar create significant environmental and economic impacts by diminishing aquatic wildlife habitat for native flora and fauna, as well as an array of special-status species. In addition to *Arundo* and salt cedar; tree-of-heaven (*Ailanthus altissima),* black locust (*Robinia pseudoacacia*), scotch broom (*Cytisus scoparius*), rattlebox (*Sesbania punicia*) and pampas grass (*Cortaderia selloana*) are also found in the Program area and have been determined to impact native plant and animal species. These non-native plants have the ability to invade and dominate riparian systems, reducing the diversity of these important ecosystems. Although some of these plants were originally introduced in order to control erosion along stream banks (*Arundo* in particular), they have actually been found to accelerate erosion and loss of topsoil when islands of invasive vegetation redirect flows onto adjacent banks, increasing bank cutting and slumping. *Arundo* rhizome mats are also not as strong as native woody plant root systems, offering weaker protection of banks. Spawning beds can be significantly impacted by sediment deposition as well as non-native plant biomass mobilized during flood events.

Resource and environmental impacts caused by these invasive non-native plants have become so significant that public agencies and community coalitions have committed to controlling/eradicating *Arundo*, salt cedar and other problematic invasive plants from natural areas. Both *Arundo* and salt cedar have been targeted as high priority invasive plants to be controlled in Tehama and Shasta Counties. The need to restore and maintain riparian habitat within the Program area is identified in the Anadromous Fish Restoration Program (AFRP) and CALFED Ecosystem Restoration Program (ERP) goals, objectives and targets. Both of these programs prioritize establishment, restoration and maintenance of native riparian habitat in the Program area.

The invasion of *Arundo* in western Shasta is in the early stages with scattered stands of giant reed occurring in the Program area. The California Invasive Plant Council (Cal-IPC), with funding from the Wildlife Conservation Board (WCB, under CADFW), has mapped *Arundo* in the Central Valley. The Program area at one time had 33.8 acres of *Arundo* mapped on 16 creeks (Figure 1). The largest invasion of *Arundo* in western Shasta, on Stillwater Creek (7.4 acres), has already been treated. Only scattered re-sprouts require treatment. The remaining 26.4 acres of *Arundo* is a top regional priority for eradication, both to stop the plant from spreading in the region, as well as spreading downstream throughout the rest of the Sacramento Valley Watershed

Financial support for this invasive non-native plant control Program will come from a range of funding sources including: State funds (WCB Prop 1 Streamflow Enhancement Program, Prop 68 State funders, State WMA funding), federal Funds (NRCS, FWS) and local entities (Counties and municipalities). Funders prioritize sustainable control of non-native invasive species as these species significantly degrade native riparian habitat, pose significant fire and flood risks, as well as use more water than native vegetation. The Program is intended to both directly and indirectly improve floodplain habitat, shaded riverine aquatic cover, as well as in-stream cover within the stream channel

Program Description:

The objective of this Program is to eradicate *Arundo* and as well as control other problematic invasive non-native plant species in riparian habitat within the Program Area. This will reduce the negative impacts of these species within the watersheds, and also reduce future spread to new areas. WSRCD proposes to eradicate *Arundo*, as well as control scattered occurrences of salt cedar, black locust, tree-of-heaven, pampas grass, rattlebox, and scotch broom from watersheds within western Shasta County and a portion of Tehama County along Cottonwood Creek, using herbicides and manual removal methods. It is anticipated that Program work will be initiated in Fall 2019.

Arundo treatments will occur on 16 rivers and creeks (Sacramento River, Rock Creek, Clear Creek, Anderson Creek, Cottonwood Creek, Hooker Creek, Churn Creek, Boulder Creek, Nelson Creek, Stillwater Creek, Moody Creek, West Fork Stillwater Creek, East Fork Stillwater Creek, Cow Creek, Little Cow Creek, and Dry Creek). The estimated size of new *Arundo* treatments is 26.4 acres within the project area, located on public and privately owned parcels within multiple watersheds in Shasta County and minor encroachment into Tehama County, California (Figure 1 – Project Area). An additional 8.4 acres of previously treated *Arundo* will be re-treated where needed. This mapping was completed by Cal-IPC for the Central Valley *Arundo* mapping project (2019), which mapped *Arundo* infestation sites from aerial imagery and known treatment areas. The mapping data was used as a baseline and increased by 20% to account for under mapping (frequently due to tree canopy obscuring *Arundo*). Individual stands of *Arundo* in the program area are quite small, typically under $1/10^{th}$ of an acre. The largest stand is 0.4 acres in size, there are 35 stands between 0.1 and 0.2 acres, and there are over 800 patches under 0.1 acres in size. In other parts of the State, individual *Arundo* stands can be as large as 40 acres and rivers and streams can have over 1,000 acres of *Arundo*. Shasta County is at an early stage of invasion by *Arundo*, this is the time to address *Arundo* before it becomes too wide spread. The small stands of *Arundo* in Shasta County are also very scattered across the landscape. Although this makes the program cover a large landscape area, the actual footprint of control work at any given site is small in scale, essentially scattered localized treatment/control.

The small size and scattered distribution of target *Arundo* stands allows control methods to be much more passive, with all work done by hand crews on foot, greatly limiting disturbance to riparian habitat. No tractors, mowers or other heavy equipment will be used. *Arundo* can be cut and removed by hand crews or treated and left in place, as determined by on site conditions, biological considerations and landowner preference.

Perennial plants are inherently difficult to control, and *Arundo* is one of the most difficult perennial plants to eradicate. This is due to the extensive rhizome network (root system) and its tenacious re-sprouting ability. *Arundo* has no viable seed, so programs can eradicate using a 'top down' approach. Shasta County is at the top of the Sacramento Watershed, so its control is a top priority as it will allow for sustainable programs to start downstream. Other target plants: salt cedar, tree-of-heaven (>1"), black locust, rattlebox, scotch broom and pampas grass are also difficult to control. Extensive field experience by landscape level invasive plant control programs have shown that the use of herbicide is the most successful control method, particularly for *Arundo*. Professionally accepted and regulatory agency approved herbicide formulations and application methods will be used. Only wetland approved formulations will be used by the program. Timing of herbicide application is an important factor in its effectiveness. Applications will be made in the late summer/early fall when plants, especially *Arundo*, are pushing energy reserves and nutrients into their roots. This is the most effective timing for treatment. Application of glyphosate, imazapyr and triclopyr, as well as manual removal using hand

tools, will occur between August 15th and November 15th (or as dictated by CDFW under the Programs Streambed Alteration Permit) with re-treatments as necessary for at least 10 years.

Two herbicide treatment methods may be used to control target invasive non-native plants: 1) cut stump/cane method and 2) foliar application method. The cut stump method involves cutting the target plant and treating the cut surface with a higher concentration but low volume of appropriate herbicide. This is a targeted application of herbicide with no drift and no risk of non-target application of herbicide. Foliar application is treating the foliage of the target plant with herbicide. This method uses lower concentration of herbicide, but uses a higher volume of material. Target plants may be bent to lower the canopy that is being treated and non-target plants may be trimmed to reduce likelihood of drift or herbicide getting on non-target plants. Crews also use bright marking dye to assure both adequate coverage of the target plant and to detect any drift. Crews trim any non-target drift from woody plants, if it occurs, to minimize any impacts. Only licensed and experienced crews carry out control work. The two methods result in a similar use of chemical over the duration of control required to achieve 100% target plant control. Both hand tools and chainsaws may be used for cutting stems of both target and non-target species. Foliar application on *Arundo* results in the highest initial control (>95%) and the lowest site disturbance. For this reason foliar application is the preferred method. Cutting and hauling canes is more labor intensive and causes minor disturbance, as foot crews haul material out of the stream channel. Cut stem applications are less effective initially, requiring greater re-treatment effort. Cut stem applications will be used where *Arundo* is too intermingled with native woody vegetation, and where very targeted herbicide applications are needed (by water, sensitive species, or elderberry plants).

Any cut vegetative material will not be left in the low flow stream channel. Cut material may be chipped and spread in adjacent disturbed areas, or disposed of. Chipped material forms a mulch layer that reduces annual weed cover. Chipped *Arundo* canes have extremely low viability and are not a risk for spreading the plant. *Arundo* has no viable seed. *Arundo* rhizome fragments are the propagule source for new plants/invasion. Non-native plant biomass will rarely be taken off site as this is cost prohibitive and typically not biologically justified.

No permanent roads will be created during this Program. Four-wheel drive all-terrain vehicles (quads) may be used in remote areas to transport supplies to treatment crews who will access target areas on foot. Quads will only operate in dry portions of the stream channels and will not cross flowing or ponded water.

TREATMENT DESCRIPTIONS:

Herbicide Control: Glyphosate, imazapyr and triclopyr herbicides were chosen due to their efficacy in controlling the target species, low toxicity to non-target organisms, and chemical properties that limit potential impacts to the environment. Aquatic EPA approved formulations for use near water will be utilized for all target plants are in riparian/wetland areas. Glyphosate is a non-selective systemic herbicide. It is applied directly to the plant where it is absorbed across leaves and stems. In plants it disrupts the shikimic acid pathway by inhibiting enzymes and reducing production of three aromatic amino acids that are vital for protein synthesis and plant growth. Imazapyr is a non-selective systemic herbicide. It is applied directly to plant where it is absorbed across leaves and stems. In plants it disrupts the production of three aromatic amino acids (different than the three impacted by glyphosate) that are vital for protein synthesis and plant growth. Triclopyr is commonly used to control woody

plants. Triclopyr does not injure grasses when used at recommended application rates. Triclopyr mimics indole auxin plant growth hormones and causes uncontrolled growth in plants. Triclopyr is absorbed by green bark, leaves, roots, and cut stem surfaces, and moves throughout the plant. Triclopyr accumulates in the meristem (growth region) of the plant.

Only certified and licensed applicators will be used to conduct applications and will use personal protective equipment as required by product labeling or Department of Pesticide Regulation (DPR) regulations.

A nonylphenol polyethoxylate (NPE) surfactant may be tank mixed with the herbicides to increase efficacy. However, most terrestrial glyphosate products contain NPE surfactants as formulation constituents and do not require additional surfactants. The NPE-based surfactants improve foliar coverage and decrease surface tension of the herbicide solution which facilitates herbicide penetration through the leaf's cuticle layer.

Foliar herbicide treatment will consist of spot-spraying individual plants by using backpack sprayers or hand held power sprayers (tanks and pumps moved by quads). No aerial (helicopter or plane) treatments are proposed. Applications will be made using low tank pressures to reduce drift potential. No herbicide applications shall take place when wind velocity exceeds ten (10) miles per hour or when there is greater than a thirty percent (30%) forecast of rain within six (6) hours of treatments. Wind speeds shall be monitored hourly when conditions warrant it. Foliar applications will be made according to product label. The NPE surfactant, when required, will be used at approximately 0.5 percent. Cut stump treatments will use higher concentrations as specified by label and will be applied by dabbing with a paintbrush or sponge applicator.

Manual Control: Small (defined as one-inch or smaller stem diameter) individual non-native plants may be removed by hand using either a weed wrench or spade. If small diameter non-native invasive plant species are found that are removable via this method, crews will use these tools to successfully remove them. Once target plants are manually removed, soil will be tamped back in place. This work will create very minor soil disturbances that could reveal or disturb sub-surface cultural resources. If any cultural resources are observed or unearthed during manual control, minor soil disturbing activities will be suspended in the immediate vicinity and herbicides will be utilized instead. Any observations of cultural resources will be reported to CDFW and appropriate cultural contacts.

General Work Conditions:
Work occurs only during daylight hours (no artificial light). No smoking occurs at work sites. Fire suppression and spill containment materials are on site. No trash or food scraps are left on site.

Species and Site-Specific Control
Treatments will be specific to site conditions and target species as follows following EPA and California registration labeling recommendations. The following are guidelines for standard application rates for target plants. Labeling guidelines for both concentration (% strength) and rate (material per acre) will be followed.

Arundo

- Foliar backpack application up to 5 percent formulated glyphosate
- Foliar power spray application with 2 percent formulated glyphosate
- Cut and paint stump with 50 percent formulated glyphosate

- Foliar backpack application up to 2 percent formulated imazapyr
- Cut and paint stump with up to 8 percent formulated imazapyr
- Foliar backpack application of a mix of up to 2 percent formulated glyphosate and up to 1 percent imazapyr
- Cut and paint stump with a mix of 50 percent formulated glyphosate and 4 percent formulated imazapyr

Salt cedar

- Small plants (< 1" diameter): foliar application of 2 to 3 percent formulated glyphosate, 0.5 percent formulated triclopyr, or a mix of 2 percent formulated glyphosate and 0.5 percent formulated triclopyr
- Large plants (≥ 1" diameter): foliar application as for smaller plants or cut and paint stump with 50 percent formulated triclopyr; plants cut will either be piled and left, or disposed of depending on landowners' preference.
- Foliar backpack application up to 2 percent formulated imazapyr
- Cut and paint stump with up to 8 percent formulated imazapyr
- Foliar backpack application up to 2 percent formulated glyphosate and up to 1 percent imazapyr
- Cut and paint stump with a mix of 50 percent formulated glyphosate and 4 percent formulated imazapyr

Tree of Heaven

- Slash cut that covers 80 percent of cambium circumference, paint with 50 percent formulated glyphosate
- Slash cut that covers 80 percent of cambium circumference, paint with 25-50 percent formulated imazapyr
- Slash cut that covers 80 percent of cambium circumference, paint with 50 percent formulated glyphosate and 25 percent formulated imazapyr
- Foliar application with mix of 2 percent formulated glyphosate and 0.5 percent formulated triclopyr
- Cut and paint stump with mix of 2 percent formulated glyphosate and 0.5 percent formulated triclopyr; follow-up treatment on sprouts
- Weed wrench small plants (≤ 1" diameter)

Pampas Grass

- Foliar backpack application up to 5 percent formulated glyphosate
- Foliar power spray application with 2 percent formulated glyphosate

Rattlebox

- Cut and paint stump with at least 50 percent formulated triclopyr
- Foliar application (0.5 percent formulated triclopyr) small plants in morning, depending on humidity
- Foliar backpack application up to 2 percent formulated imazapyr
- Cut and paint stump with up to 8 percent formulated imazapyr
- Foliar backpack application with a mix of up to 2 percent formulated glyphosate and up to 1 percent imazapyr
- Cut and paint stump with a mix of 50 percent formulated glyphosate and 4 percent formulated imazapry

Black Locust

- Cut and paint stump with at least 50 percent formulated triclopyr
- Foliar application (0.5 percent formulated triclopyr) small plants in morning, depending on humidity
- Foliar backpack application up to 2 percent formulated imazapyr
- Cut and paint stump with up to 8 percent formulated imazapry
- Foliar backpack application with a mix of up to 2 percent formulated glyphosate and up to 1 percent imazapyr
- Cut and paint stump with a mix of 50 percent formulated glyphosate and 4 percent formulated imazapry

Scotchbroom

- Foliar backpack application up to 5 percent formulated glyphosate
- Cut stump application with either 50 percent formulated glyphosate or 0.5 percent formulated triclopyr for large infestations with mature plants exceeding 2" basal diameter.
- Foliar backpack application up to 2 percent formulated imazapyr
- Cut and paint stump with up to 8 percent formulated imazapyr
- Foliar backpack application with a mix of up to 2 percent formulated glyphosate and up to 1 percent imazapyr
- Cut and paint stump with a mix of up to 50 percent formulated glyphosate and 4 percent formulated imazapry

Program Duration and Timing: It is anticipated that Program work will be initiated in Fall 2019. Implementation of this proposed action will occur each year between August 15 and Nov 15, or as dictated by CDFW under the Programs Streambed Alteration Permit. Re-treatment in subsequent years will access treatment areas via foot and carryout treatments with backpack application (between August 15 to Nov 15, or as dictated by CDFW under the Programs Streambed Alteration Permit).

Program Monitoring: WSRCD will monitor for efficacy of treatments (effectiveness). Monitoring will be conducted by the WSRCD on a yearly basis to determine the success of the prior year's treatments and to determine the timing and location of re-treatments. *Arundo* eradication is a long-term commitment. Initial program work typically treats sites every year for the duration on the funding source (typically 3-5 years for grant funded work). Longer term re-treatments typically re-treat in alternating years to maintain efficiency and increase detection rates.

Surrounding Land Uses and Setting: The Program lies within Western Shasta County and portions of Tehama County in the northern part of the Sacramento Valley (Figure 1). The upstream portion of the system includes the eastern slopes of the North Coast Mountain Range, the Klamath Mountains, the southern slopes of the Trinity Mountain Range, and the foothills of the western Sierras. Sixteen rivers and creeks (Sacramento River, Rock Creek, Clear Creek, Anderson Creek, Cottonwood Creek, Hooker Creek, Churn Creek, Boulder Creek, Nelson Creek, Stillwater Creek, Moody Creek, West Fork Stillwater Creek, East Fork Stillwater Creek, Cow Creek, Little Cow Creek, and Dry Creek) are the primary habitat enhancement areas. These rivers and creeks wind through the Sacramento Valley uplands and the valley floor composed of blue oak/gray pine stands with grasslands. The creek corridor has a broad floodplain and meandering stream channel with riparian vegetation.

The Program Area is located in an area of large ranches and areas used for wildlife production as well as rural residential developments ranging in size from individual lots to five and ten acre ranchettes. Urbanized areas are found along the Sacramento Valley floor (Reading, Anderson) along with scattered towns.

Permission for work to occur: WSRCD will obtain written permission from each public or private landowner prior to work occurring. These Right Of Entry (ROE) authorizations describe the invasive non-native plant control work that is to occur, specifies the regulatory permits that have been secured to allow the work, and gives the WSRCD permission to enter the property to implement the work. The property owner also indicates who to contact, how to contact, and any other logistics required on the property for all parties. No work will occur on a given property without authorization from the land owner/manager.

Other Public Agencies Whose Approval is Required:

- CDFW Streambed Alteration 1600 Permit
- U.S. Fish and Wildlife Service Federal Endangered Species Act, Informal Consultation/Technical Assistance Letter
- Tehama County Agriculture Department Herbicide Use Permits
- National Marine Fisheries Service Federal Endangered Species Act Informal Consultation/Technical Assistance Letter

PROPOSED MITIGATION MEASURES

The following is a list of Mitigation Measures that shall be implemented by the WSRCD in order to avoid or minimize potential environmental impacts. Implementation of these Mitigation Measures would reduce the potential environmental impact of the proposed Program to a less-than-significant level. These measures are based on previous CDFW/USFWS guidance. CDFW and or USFWS/NOAA may modify these conditions under additional regulatory permits that may be required by the program. Any modifications to proposed mitigation measures will be followed to ensure protection of environmental resources.

Mitigation Measures:

Bio-1. To mitigate potential physical or chemical impacts to elderberry (*Sambucus* spp.) potentially supporting valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), WSRCD will follow the following treatment protocols:

1) Treatment areas will be pre-checked for the presence of elderberry plants.
2) Any plants detected will be avoided with the following procedures as outlined under the: Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*) May 2017, prepared by the USFWS. https://www.fws.gov/sacramento/documents/VELB_Framework.pdf

Visual surveys for the VELB, which includes looking for adults and/or exit holes, are currently the only approved method of surveying for the species and are not entirely reliable for determining presence or absence (see below). Visual surveys, habitat assessments, and mitigation site monitoring do not require a section 10(a)(1)(A) recovery permit.

The following measures are incorporated into the proposed Program to avoid and minimize effects to VELB and/or its habitat.

Worker education. A qualified biologist will provide training for all contractors, work crews, and any onsite personnel on the status of the VELB, its host plant and habitat, the need to avoid damaging the elderberry shrubs, and the possible penalties for non-compliance.

Work site monitoring. A qualified biologist will monitor the work area at Program appropriate intervals to assure that all avoidance and minimization measures are implemented.

Timing. As much as feasible, all activities that could occur within 50 meters (165 feet) of an elderberry shrub, will be conducted outside of the flight season of the VELB (March - July).

Chemical Usage. Herbicides will not be used within the drip-line of the shrub. All chemicals will be applied using a backpack sprayer or similar direct application method.

Manual. Mechanical weed removal within the drip-line of the shrub will be limited to the season when adults are not active (August - February) and will avoid damaging the elderberry.

If any elderberry plants are present within treatment areas, the WSRCD Program Manager shall assure that all elderberry plants are protected from potential herbicide overspray by using these methods within a 20 foot buffer around elderberry plants, but outside the dripline of the elderberry plants): 1) directing the work crew to hand cut all target plants, 2) cut stumps will then treated with glyphosate or triclopyr (imazapyr will not be used), and 3) no power spraying equipment will be used within 50 feet of elderberry plants. Alternately, invasive species less than one inch in

diameter may be removed using a weed wrench as long as roots of elderberry are not affected. The WSRCD Program Manager shall demonstrate compliance with this measure through the submission of annual reports due to the California Department of Fish and Game's Northern Region Lake and Streambed Alteration Agreement Program no later than May31 each year that the Program is implemented.

Arundo canes within the drip line of elderberry plants should be treated, but this will not occur without explicit agreement from CDFW and FWS. The treatment method would be glyphosate applied to cut *Arundo* cane surfaces, as glyphosate is not mobile. Hand tools (loppers and pruners) would be used to cut *Arundo* within the drip line of the elderberry plant (no chain saws). No cutting or damage to elderberry stems greater than 1" would occur. A request for this work will be made if any *Arundo* patches are found to occur within the drip line of elderberry plants.

Bio-2: To reduce disturbance-related impacts to foothill yellow-legged frog (*Rana boylii*), the WSRCD Program Manager shall direct crews to minimize disturbances in areas where any foothill yellow-legged frog are observed. Treatment of these areas may proceed under the following circumstances: 1) areas occupied by foothill yellow-legged frog or with active stream flow shall be treated later in the season (August 15 to Nov 15, or as dictated by CDFW under the Programs Streambed Alteration Permit), when flows have ceased or the frogs have left the area; or 2) pursue an alternate plan that avoids harassment/mortality and minimizes other physical habitat disturbances in coordination with the written permission of the California Department of Fish and Game's Northern Region Lake and Streambed Alteration Agreement Program. The WSRCD Program Manager shall demonstrate compliance with this measure through the submission of annual reports due to the California Department of Fish and Game's Northern Region Lake and Streambed Alteration Agreement Program no later than May 31of each year that the Program is implemented.

Bio-3: To reduce wildlife disturbance, the WSRCD Program Manager shall direct crews to avoid spraying in the presence of wildlife observed in the treatment areas. Areas that are not sprayed due to the presence of wildlife may be sprayed once wildlife have left the treatment area. Areas with suspected occupied nesting or denning habitats shall also be avoided and not treated using manual plant removal methods or herbicides until wildlife have left the area. The WSRCD Program Manager shall demonstrate compliance with this measure through the submission of annual reports due to the California Department of Fish and Widlife's Northern Region Lake and Streambed Alteration Agreement Program no later than May31of each year that the Program is implemented.

Haz-1: To reduce potential impacts associated with fuel spills in riparian areas, the Program Manager shall ensure that gasoline at no time is transported across a flowing stream. Only existing roads shall be used to move personnel, equipment and materials into and out of the Program site. The amount of time vehicles (quads) transporting other chemicals pass through flowing or standing water shall be minimized. The Program Manager shall select fuel storage, refueling and maintenance areas for equipment on flat disturbed upland sites that are away from dry or wet waterways and areas that could potentially flow into a stream in the event of an accidental spill. Spill/fuel containment materials and equipment shall be made available and used at refueling and maintenance areas. Equipment shall be stored and maintained within properly cleared areas. The Applicator shall be responsible for immediate containment and removal of any spilled material. The clean-up of all petroleum and/or chemical spills shall begin immediately and the appropriate authorities and CDFW shall be notified immediately if a spill occurs. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur. The Program Manager or certified Applicator

shall make daily inspections for leaks, correcting and repairing any such leaks prior to resuming their use. The daily inspections shall be incorporated into the Program files along with evidence of any repairs required and completed before returning equipment to Program work sites. The WSRCD Program Manager shall demonstrate compliance with this measure through the submission of annual reports due to the California Department of Fish and Game's Northern Region Lake and Streambed Alteration Agreement Program no later than May 31of each year that the Program is implemented.

Haz-2: To reduce impacts associated with exposure of people or structures to wildland fires, the WSRCD Program Manager shall ensure that adequate fire protection equipment is available at work sites. This shall include fire extinguishers attached to all mechanized equipment. In addition, firefighting hand tools shall be made available at all areas where mechanical equipment is operated. The WSRCD Program Manager, Applicators, and all workers shall comply with all applicable fire safe standards as found in Public Resources Code Division 4, Chapter 6, (PRC's 4427, 4428, 4429, 4431, 4442, list not all inclusive). Vehicles shall not be parked in tall grass or any other location where heat from the exhaust system could ignite a fire. All motorized equipment shall have approved spark arrestors. A dependable radio or phone communication shall be available on site to report any emergency which may occur. All cut non-native vegetation shall be removed from the stream area. Treated invasive species that have the potential to cause a significant fire risk to surrounding vegetation and structures or the potential to cause an obstruction to any structure shall have canes, limbs or other vegetative material removed and chipped or disposed of in a legal manner. The WSRCD Program Manager shall demonstrate compliance with this measure through the submission of annual reports due to the California Department of Fish and Game's Northern Region Lake and Streambed Alteration Agreement Program no later than May 31of each year that the Program is implemented.

Summary of Findings: This Initial Study/Mitigated Negative Declaration (IS/MND) has been prepared to assess the Program's potential effects on the environment and the significance of those effects. Potentially significant environmental effects could result from the proposed Program. WSRCD revised its Program plans and has agreed to implement Mitigation Measures, which will eliminate or reduce environmental impacts to a less-than-significant level. Based upon this IS/MND, WSRCD has determined that the proposed Program would have no significant effects on the environment once Mitigation Measures are implemented. WSRCD has found, in consideration of the entire record, that there is no substantial evidence that the proposed Program as currently revised and mitigated would result in a significant effect upon the environment. The IS/MND is therefore the appropriate document for CEQA compliance.

This conclusion is supported by the following findings:

- The Program would result in no impacts to Agriculture Resources, Air Quality, Land Use and Planning, Mineral Resources, Population and Housing, Public Services, Recreation, Transportation/Traffic, or Utilities and Service Systems.
- The Program would have impacts below a level of significance to Aesthetics, Cultural Resources, Geology and Soils, Greenhouse Gas Emissions, Hydrology and Water Quality, and Noise.
- Mitigation Measures would be implemented to reduce potentially significant impacts to less-than-significant levels for Biological Resources and Hazards and Hazardous Materials.
- The Program would not substantially degrade the quality of the environment. It is anticipated that the Program would benefit the habitat for riparian habitat and special status species.

- The Program would not achieve short term environmental improvement to the disadvantage of long term environmental improvement.
- The Program would not have environmental effects that are individually limited but cumulatively considerable.
- The Program would not have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly.
- The Program incorporates all applicable Mitigation Measures as listed below and described in the initial study.
- The mitigated negative declaration reflects the independent judgment of the Lead Agency.

Initial Study and Environmental Checklist Form

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:
The environmental factors checked below would be potentially affected by this Program, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

❒	Aesthetics	❒	Agriculture Resources	❒	Air Quality
x	Biological Resources	❒	Cultural Resources	❒	Geology/Soils
x	Hazards & Hazardous Materials	❒	Hydrology/Water Quality	❒	Land Use/Planning
❒	Mineral Resources	❒	Noise	❒	Population/Housing
❒	Public Services	❒	Recreation	❒	Transportation/Traffic
❒	Utilities/Service Systems	x	Mandatory Findings of Significance		

DETERMINATION: (To be completed by the Lead Agency)
On the basis of this initial evaluation:

❒ I find that the proposed Program COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

X I find that although the proposed Program could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Program have been made by or agreed to by the Program proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

❒ I find that the proposed Program MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

❒ I find that the proposed Program MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by Mitigation Measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

❒ I find that although the proposed Program could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or Mitigation Measures that are imposed upon the proposed Program, nothing further is required.

_____ _____

Signature **Date**

Chester Anderson, District Manager
Western Shasta Resource Conservation District

ANALYSIS OF POTENTIAL ENVIRONMENTAL IMPACTS

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. Aesthetics. Will the Program:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which will adversely affect day or nighttime views in the area?	☐	☐	☐	☒

Discussion: Presently, the Program Area has scattered occurrences of target non-native species. These plants have in some areas altered the natural visual character of riparian zones by both expanding into native riparian areas and in some instances eliminating native plant and animal species altogether. In the short term, this Program will impact views by controlling non-native plants resulting in areas of dead and desiccated vegetation. After several growing seasons, controlled vegetation will either decompose or float away during annual winter flooding events (for those that are foliar treated in place). Some target non-native plants will be cut, hauled out of riparian areas and be chipped or disposed of. Once this occurs, native grass, shrub and tree species will begin to populate the Program Area's riparian habitats and restore the natural scenic character of the riparian system. Aesthetic impacts during subsequent herbicide re-treatments will be less obvious as the size of invasive plant re-growth will be much smaller than found during the initial treatment, thus minimizing the amount of dead vegetation left on site.

Impact: Impacts to Aesthetics are below a level of significance.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
II. Agriculture and Forest Resources.				
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997, as updated) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Program and the Forest Legacy Assessment Program; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the Program:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of	☐	☐	☐	☒

Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				
b) Conflict with existing zoning for agricultural use or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of forest land (as defined in Public Resources Code §12220(g)), timberland (as defined by Public Resources Code §4526), or timberland zoned Timberland Production (as defined by Government Code §51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Discussion: At the present time, flood flows are re-directed from stream channels to adjacent banks by stands of *Arundo* and salt cedar within the active channel. The Program will benefit agriculture and ranch operations through a reduction in stream bank erosion which currently removes large chunks of farm and ranch soils during flood events. In addition, through the removal of invasive species within the Program's impact area, seed stocks/vegetative propagules of these invasive plants will be reduced, as will their impacts to adjacent range and wild lands.

Impact: No adverse impacts to Agricultural and Forest Resources are anticipated.

ENVIRONMENTAL ISSUES	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
III. Air Quality.				
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied on to make the following determinations. Will the Program:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or Programed air quality violation?	☐	☐	☐	☒
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the Program region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☒
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒

Discussion: Chemical treatments will be made in strict accordance with label instructions and State of California regulations by certified Applicators using only products registered for use in wetland habitats by the EPA and registered in CA. In order to prevent chemical drift, herbicide applications will be made only during daylight hours when winds velocities do not exceed ten miles per hour. Wind speeds will be monitored hourly when conditions

warrant it. Herbicide treatments will not occur when there is a 30 percent forecast of rain within six hours of such treatment. In addition, only quads will be used for transport of personnel and equipment on the Program site along with periodic use of chain saws.

Impact: No adverse impacts to Air Quality are anticipated.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
IV. Biological Resources. Will the Program:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?	☐	☐	☒	☐
c) Have a substantial adverse effect on wetlands as defined by the Department of Fish and Game (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Discussion: A query of the California Natural Diversity Database (CNDDB) was carried out in August 2018 for species in the Program Area (Figure 2). Only species expected to occur in the Program Area (riparian vegetation, or ecotones) are included in this analysis. The Cal Fish database and numerous other references (including data from USFWS) were also reviewed in order to determine the possible occurrence of special status species.

The Program will have an overall positive impact on riparian and aquatic habitats that benefit salmonids and other riparian dependent wildlife. Eradicating target non-native invasive plant species will allow native plants to reoccupy portions of the Program Area where they were eliminated by the encroachment of the target non-native invasive plant species, particularly *Arundo* and salt cedar.

Potential Toxicological Impacts of Herbicides to Biological Resources:

Risk assessments for the herbicides that will be used in this Program are based on procedures used by the US Forest Service (Syracuse Environmental Research Associates SERA 2014 & 2011). Using this approach involves calculating a Hazard Quotient (HQ) by dividing exposure by standardized toxicity values (i.e. lethal dose 50- LD50 or, more preferably, No Observable Adverse Effect Level (NOAEL) values). The USFS uses an HQ value of 1.0 as

the Level of Concern (LOC) for both terrestrial and aquatic species. **HQ values that are less than 1.0 are considered to pose no significant risk to non-target species.**

Glyphosate:
Glyphosate is a non-selective systemic herbicide that can damage all groups or families of plants to varying degrees. Glyphosate inhibits the production of aromatic amino acids and certain phenolic compounds. This leads to a variety of toxic effects in plants, including the inhibition of photosynthesis, respiration, and nucleic acid synthesis, thereby resulting in cellular disruption, decreased growth, and death at sufficiently high levels of exposure. Upland formulations may contain surfactants (additives) that can contribute additional toxicity to the formulation, principally to aquatic organisms. This program will use aquatic approved formulations of glyphosate for treatments. Research summarized by the United States Forest Service (USFS) assessed the toxicological impact of glyphosate-based herbicides on non-target flora and fauna using the HQ method (SERA 2014, 2011a). Toxicity values (NOAEL, preferably) derived from tests conducted with glyphosate formulations that contained surfactants were used. Because of the additional toxicity that may be contributed by surfactants, formulated product assessments are more conservative in their approach than assessments that use only the herbicide active ingredient. All assessments are based on spot spray terrestrial applications made by backpack applicators that result in an overall use rate of **1 lb/a.e./ac** (acid equivalent per acre). This is appropriate given the scattered distribution of target non-native plants across the landscape. Glyphosate's relatively brief environmental persistence and the low potential for repeat applications during a single season significantly reduce the potential for chronic exposure to non-target organisms. For that reason, this assessment is limited to acute exposure scenarios.

Imazapyr:
Imazapyr is a broad-spectrum, non-selective systemic herbicide used for control of annual and perennial plants including grasses, sedges, broadleaf species, and woody plants. Upland formulations may contain surfactants that can contribute additional toxicity to the formulation, principally to aquatic organisms. This program will use aquatic approved formulations of glyphosate for treatments. Imazapyr based products are most frequently applied as foliar sprays, using a wide variety of application equipment including backpack sprayers, power hand-guns but may also be used on cut stem surfaces as well as low volume applications of more concentrated material. Research summarized by the United States Forest Service (USFS) assessed the toxicological impact of glyphosate-based herbicides on non-target wildlife species using the HQ method (SERA 2014, 2011a). Toxicity values (NOAEL, preferably) derived from tests conducted with glyphosate formulations that contained surfactants were used. Because of the additional toxicity that may be contributed by surfactants, formulated product assessments are more conservative in their approach than assessments that use only the herbicide active ingredient. All assessments in this MND are based on spot spray terrestrial applications made by backpack applicators that result in an overall use **rate of 1 lb/a.e./ac** (acid equivalent per acre). This rate will not be exceeded. Label rates vary from 0.125 to 1.5 lb/ac depending on target vegetation and purpose of application. Imazapry's low potential for repeat applications during a single season significantly reduce the potential for chronic exposure to non-target organisms. For that reason, this assessment is limited to acute exposure scenarios.

Triclopyr:
Triclopyr is a selective, systemic herbicide effective only on broadleaf and woody species (grasses are not damaged by Triclopyr). Triclopyr mimics auxin, a plant growth hormone, thus disrupting the normal growth and viability of plants. Amine formulations are water-soluble and, in general, pose lower toxicity risk to non-target wildlife species compared to products that contain the triclopyr ester. Triclopyr amine-based products are frequently applied as foliar sprays, using a wide variety of application equipment including backpack sprayers, power hand-guns but may also be used on cut stem surfaces as well as low volume applications of more concentrated material. Research summarized by the United States Forest Service (USFS) assessed the toxicological impact of triclopyr amine-based herbicides on non-target wildlife species using the HQ method (SERA 2014, 2011b). All assessments are based on spot spray terrestrial applications made by backpack applicators that result in an overall use rate of 1 lb/a.e./ac. Triclopyr's relatively brief environmental persistence and the low potential for repeat applications during a single season significantly reduce the potential for chronic exposure to non-target organisms. For that reason, this assessment is limited to acute exposure scenarios.

Best management practices will be followed prior to and during implementation. The following list includes some, but not all, of the standard operating procedures that will be followed.

- Only licensed applicators will apply herbicide.
- Directions in the herbicide product label will be followed for use, storage, and personal protection.
- Herbicide products will be selected carefully to minimize additional impacts from degradants, adjuvants, inert ingredients, and tank mixtures.
- The least amount of herbicide needed to achieve the desired result will be applied.
- The effects of wind, humidity, temperature inversions, and heavy rainfall on herbicide effectiveness and risk will be considered for every application.
- Spraying will not occur when rain is forecasted. If weather conditions change to rain during an herbicide application session, the session will be terminated and resumed when precipitation ceases.
- Herbicides will only be applied when the wind speed is less than 10 mph to minimize drift.
- Site characteristics, environmental conditions, and application equipment will be considered in order to avoid and minimize damage to non-target vegetation.

The applicator will develop a safety plan prior to herbicide use that includes an emergency spill plan, safety data sheets for each herbicide, and identification of appropriate personal protective equipment. All workers, including contractors, will receive training to carry out the safety plan and will have a copy of the plan in their possession during herbicide use. Toxicological risk information is provided below for each major taxonomic group.

Special Status Species:

Resources discussed below include special status plants, invertebrates, fishes, amphibians, reptiles, birds, and mammals. "Special status species" include all species tracked by CNDDB potentially occurring in the Program work area, and include all those which meet the CEQA definition of Endangered, Rare, or Threatened (Figure 2-4, see CEQA Guidelines, § 15380).

Special Status Plant Species:

The special-status plants discussed below are known from the vicinity of the Program Area. Only species expected to occur in the Program Area (riparian vegetation, or ecotones) are included in this analysis.

Treatment methods using herbicides (chemicals that kill plants) are being used by the invasive non-native plant control program. Application methods will assure that these chemicals are applied to target plants, and that special status plant species are not impacted/affected. Manual control methods (pulling/extraction) will be applied to target invasive non-native plants only.

Glyphosate: Glyphosate affects both grass and broadleaf plant species. Glyphosate's strong soil adsorption potential greatly limits herbicide activity in soil. For that reason, only foliar uptake via direct spray or drift, (and not root uptake) is considered in this assessment. Using a sensitive plant NOEAC of 0.02 lbs a.e./ac will result in a HQ value of 50 when non-target plants are directly sprayed. However, the use of a 12.5 ft buffer zone around special status plant populations would reduce the HQ to 0.8. Additionally, annual sensitive plant species will be senesced or dormant during the herbicide application period, effectively eliminating any possibility of foliar absorption. The application timing will effectively reduce the risk to non-target plants to insignificance.

Imazapyr: Imazapyr affects both grass and broadleaf plant species. Imazapyr's weak soil adsorption, mobility, and persistence make this herbicide inappropriate to use near sensitive plant species. Using a sensitive plant NOEAC of 0.000064 lbs a.e./ac will result in a HQ value of 15,625 when non-target plants are directly sprayed. However, the use of a 150 ft buffer around sensitive plant species will be used to effectively reduce the risk to non-target plants to insignificance.

Triclopyr: Triclopyr affects broadleaf plant species. However, the herbicide is not readily taken in to plants through the root system. For this reason, only foliar uptake via direct spray or drift (and not root uptake) is considered in this assessment. Using a sensitive plant NOEAC of 0.0028 lbs a.e./ac will result in a HQ value of 357 when non-target

plants are directly sprayed. However, the use of a 50 ft buffer zone around listed plant populations would reduce the HQ to 0.9. Additionally, some sensitive plant species may be senesced or dormant during the herbicide application period, effectively eliminating any possibility of foliar absorption. The application timing will effectively reduce the risk to non-target broadleaf plants to insignificance. Further, monocot species including grasses are tolerant of triclopyr exposure and will be unaffected by the use of this herbicide.

Silky cryptantha (Cryptantha crinita): Silky cryptantha is listed as State Rank S2 and California Rare Plant Rank 1B.2. It is an herbaceous annual that is associated with foothill woodland, yellow pine forest, Valley grassland but may also occasionally be found in riparian areas. Most records (historic and recent) occur in Shasta and Tehama Counties. The plant's flowering period (April to May) is well outside of the proposed work window, and the plant is expected to have completed its above ground reproduction (flowering and seed set) prior to commencement of work. Potential impacts to this species are therefore expected to be below a level of significance.

Impact: Impacts to special status plant species are below a level of significance.

Dubious pea (Lathyrus sulphureus var. argillaceus): Dubious pea is listed as State Rank S1S2California Rare Plant Rank 3. It is an herbaceous perennial that is associated with foothill woodlands, lodgepole/red fir/yellow pine forests, although collections indicate it can occur in meadows. It is threatened by grazing, road widening, non-native plants and development (CNPS). It has very few recent records in the Sierra Foothills and two records from 1899 in Tehama County near Cottonwood Creek and a single record from 1911 in what is now Redding but was a meadow. Program activities are not likely to impact the species as work activities are in riparian habitat. The plant's flowering period (April to June) is well outside of the proposed work window, and the plant is expected to have completed its above ground reproduction (flowering and seed set) prior to commencement of work. Potential impacts to this species are therefore expected to be below a level of significance.

Impact: Impacts to special status plant species are below a level of significance.

Legenere (Legenere limosa): Legenere is listed as California Rare Plant Rank 1B.1. It is an herbaceous annual that is associated with vernal pools, vernal marshes, lakes, ponds, and sloughs. It is threatened by grazing, road widening, non-native plants and development (CNPS). It occurs in the North Coast Range, southern Sacramento Valley, northern San Joaquin Valley, and the San Francisco Bay Area. It produces small, white flowers in early summer (May or June). Although there is no vernal pool habitat within the Program's impact area, a number of sloughs exist. Program activities including vehicle or foot traffic, and target non-native invasive plant removal measures could disturb potential habitat for this species. The plant's flowering period (April to June) is well outside of the proposed work window, and the plant is expected to have completed its life cycle prior to commencement of work. Potential impacts to this species are therefore expected to be below a level of significance.

Impact: Impacts to special status plant species are below a level of significance.

Special Status Invertebrate (Insect) Species:

Glyphosate: The United States Environmental Protection Agency (USEPA) uses a honeybee contact toxicity test to estimate glyphosate toxicity to non-target insects. The toxicity value used in this assessment is 260 mg a.e./kg. Using an exposure scenario that involves direct application of the herbicide to bees produces an HQ value of 0.3 (68.61/260). This value is below the LOC which indicates that the formulated herbicide poses no significant toxicity risk to invertebrates.

Imazapyr: The USEPA uses a honeybee contact toxicity test to estimate glyphosate toxicity to non-target insects. The toxicity value used in this assessment is NOAEL 860 mg a.e./kg. Using an exposure scenario that involves direct application of the herbicide to bees produces an HQ value of 0.08 (68.61/860). This value is below the LOC which indicates that the formulated herbicide poses no significant toxicity risk to invertebrates.

Triclopyr: The USEPA also uses a honeybee contact toxicity test to estimate triclopyr amine toxicity to non-target insects. The toxicity value used in this assessment is 620 mg a.e./kg. Using an exposure scenario that involves direct

application of the herbicide to bees produces an HQ value of 0.1 (68.61/620). This value is below the LOC which indicates that the formulated herbicide poses no significant toxicity risk to non-target invertebrates.

Wawona riffle beetle (Atractelmis wawona): The Wawona riffle beetle occurs in riffles of rapid clear mountain streams at moderate elevations ranging between (2,000' to 5,000') which is above the highest point of the Program area. Consequently impacts to this species are not anticipated.

Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus): The valley elderberry longhorn beetle (VELB) is listed as Threatened under the Federal Endangered Species Act (FESA). VELB is associated with elderberry trees (*Sambucus* spp.) in California's Central Valley during its entire life cycle. The complete life cycle of the valley elderberry longhorn beetle has four stages: egg, larva, pupa, and adult. The adult beetles are active, feeding and mating, from March until June. After mating, their eggs are deposited on live elderberry bushes in the crevices of the bark, at the stem/trunk junctions, or at the stem/ petiole junctions. After hatching the larvae bore through the bark into the pith of the elderberry stem where they tunnel and eat for up to two years. For the larvae to be successful in completing the cycle the stems of the elderberries must be at least 1.0 inch in diameter at ground level. In their last stage, larvae bore back out of the stem (thereby creating the "exit hole") and then return to the pith, closing the exit hole with a substance composed of wood shavings or chewed wood and excrement called "frass". The larvae then enter the pupal stage. After transformation, the adult beetle need only break through the frass plug at the exit hole to continue the cycle once again among the elderberries. Typically, adult valley elderberry longhorn beetles emerge at about the same time as the elderberry flowers bloom (between mid-March and mid-June). Lizards, European earwigs, and non-native Argentine ants prey upon the various life stages of the valley elderberry longhorn beetle.

Adult VELB live for a few days to a few weeks between mid-March and mid-May with most records from late April to mid-May. Adults feed on elderberry leaves and possibly flowers. VELB are widespread, although rare, in suitable riparian habitat along the Sacramento River. The relatively small proportion of current-year emergence holes suggests that the population is limited at any one site by factors other than habitat availability. Within the Sacramento River floodplain, VELB does not appear to be restricted to particular kinds of riparian vegetation or floodplain topography. VELB emergence holes were found in nearly all situations, ranging from isolated elderberry clumps in savanna-like areas to continuous stands beneath tall overstories, areas with or without extensive woody understory vegetation, and on both low- and high-terrace floodplains. There are 201 recorded occurrences of VELB within the California Natural Diversity Database (CNDDB), including one record in Cottonwood on the Shasta County side and several others nearby within Shasta and Tehama Counties (Figure 3-4). Based upon this information, VELB can be assumed to be present in the Program Area.

Removal of the target non-native invasive species will have a long-term beneficial effect on habitat for VELB, particularly those riparian habitat features that are associated with higher quality VELB habitat (e.g. mature overstory and mixed understory). Reduction of bank erosion is expected to potentially occur as a result of removing *Arundo*, in particular. This may indirectly benefit elderberries that are either subject to higher velocity flows (where they may be washed out) or occur near stream banks that may be lost to bank erosion events.

During work, adult VELB will not be present, but VELB in the pupa and/or larva stage will be burrowed inside of elderberry plants. Due to low herbicide toxicity values, negative effects are not expected. Therefore VELB would not be directly impacted by herbicide application but instead could be indirectly impacted due to overspray on elderberries (i.e. the risk is to the habitat/host plant). Typically, elderberries observed in the Program Area are individual plants, as opposed to growing in clusters. Similarly, target non-native invasive plants are also typically scattered and are not clustered together. Elderberries can be damaged and/or killed by exposure to glyphosate, imazapyr and/or triclopyr. At the time of Program work activities (fall), elderberries will be in the final or complete stages of fruit development, plants will not be dormant, or will be entering dormancy, and could be damaged or killed by glyphosate. imazapyr or triclopyr.

Impact Bio-1: Impacts to elderberry plants supporting valley elderberry longhorn beetle would be significant. Incorporation of Mitigation Measure Bio-1 will reduce this impact below a level of significance.

Bio-1. To mitigate potential physical or chemical impacts to elderberry (*Sambucus* spp.) plants potentially supporting valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), WSRCD will follow the following treatment protocols:

1) Treatment areas will be pre-checked for the presence of elderberry plants.
2) Any plants detected will be avoided with the following procedures as outlined under the: Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*) May 2017, prepared by the USFWS. https://www.fws.gov/sacramento/documents/VELB_Framework.pdf

Visual surveys for the VELB, which includes looking for adults and/or exit holes, are currently the only approved method of surveying for the species and are not entirely reliable for determining presence or absence (see below). Visual surveys, habitat assessments, and mitigation site monitoring do not require a section 10(a)(1)(A) recovery permit.

The following measures are incorporated into the proposed Program to avoid and minimize effects to VELB and/or its habitat.

Worker education. A qualified biologist will provide training for all contractors, work crews, and any onsite personnel on the status of the VELB, its host plant and habitat, the need to avoid damaging the elderberry shrubs, and the possible penalties for noncompliance.

Work site monitoring. A qualified biologist will monitor the work area at Program appropriate intervals to assure that all avoidance and minimization measures are implemented.

Timing. As much as feasible, all activities that could occur within 50 meters (165 feet) of an elderberry shrub, will be conducted outside of the flight season of the VELB (March - July).

Chemical Usage. Herbicides will not be used within the drip-line of the shrub. All chemicals will be applied using a backpack sprayer or similar direct application method.

Manual. Mechanical weed removal within the drip-line of the shrub will be limited to the season when adults are not active (August - February) and will avoid damaging the elderberry.

If any elderberry plants are present within treatment areas, the WSRCD Program Manager shall assure that all elderberry plants are protected from potential herbicide overspray by using these methods within a 20 ft buffer around elderberry plants, but outside the dripline of the elderberry plants: 1) directing the work crew to hand cut all target plants, 2) cut stumps will then treated with glyphosate or triclopyr (imazapyr will not be used), and 3) no power spraying equipment will be used within 50 ft of elderberry plants. Alternately, invasive species less than one inch in diameter may be removed using a weed wrench as long as roots of elderberry are not affected. The WSRCD Program Manager shall demonstrate compliance with this measure through the submission of annual reports due to the California Department of Fish and Game's Northern Region Lake and Streambed Alteration Agreement Program no later than May31each year that the Program is implemented.

Arundo canes within the drip line of elderberry plants should be treated, but this will not occur without explicit agreement from CDFW and FWS. The treatment method would be glyphosate applied to cut *Arundo* cane surfaces, as glyphosate is not mobile. Hand tools (loppers and pruners) would be used to cut *Arundo* within the drip line of the elderberry plant (no chainsaws). No cutting or damage to elderberry stems greater than 1" would occur. A request for this work will be made if any *Arundo* patches are found to occur within the drip line of elderberry plants.

Vernal Pool Fairy Shrimp (Branchinecta lynchi): Vernal pool fairy shrimp is listed as Threatened under FESA. This species inhabits vernal pools or similar ephemeral wetlands and grassed or mud bottomed pools or basalt flow depression pools in unplowed grasslands. Although it occurs most often in vernal pools it also inhabits a variety of natural and artificial seasonal wetland habitats, such as alkali pools, ephemeral drainages, stock ponds, roadside ditches, vernal swales, and rock outcrop pools. Regardless of the habitat, the wetlands in which this species is found are normally small and shallow; however it occasionally inhabits large (479,000 sq ft) and deep (4') habitats. The pools vary in size from over 25 acres to less than 1000 square feet. It occurs at temperatures between 6 and 20 degrees C in soft and poorly buffered waters. Eggs are dropped from the brooding female to the benthos. The eggs

hatch when the vernal pools and swales fill with rainwater and the immature stages rapidly develop into adults which have been collected from early December to early May. It is unlikely that this species occurs within the Program area and also unlikely that the Program would result in an impact.

Impact: No adverse impacts to vernal pool fairy shrimp are anticipated.

Vernal Pool Tadpole Shrimp (Lepidurus packardi): This large tadpole shrimp is listed as Endangered under FESA and is found in a variety of natural and artificial, seasonally ponded habitat types including: vernal pools, swales, ephemeral drainages, stock ponds, reservoirs, ditches, backhoe pits, and ruts caused by vehicular activities. Like the fairy shrimp, wetland habitat in which this species can be found vary in size from very small to very large and exhibit extremes in depth and volume. Adults are omnivorous, foraging on detritus, vegetation and other aquatic invertebrates when available. Early instar stages are most likely obligate filter feeders which later increase active prey consumption. It is unlikely that this species occurs within the Program area and also unlikely that the Program would result in an impact.

Impact: No adverse impacts to vernal pool tadpole shrimp are anticipated.

Special Status Fish Resources:

Glyphosate: Using a conservative glyphosate exposure estimate that involves substantial drift to water (0.011 mg/L) and a 96-h NOAEL value for sensitive fish species (0.04 mg/L) yields an HQ value of 0.3. This value is below the LOC which indicates that the herbicide formulation poses no significant risk to fish.

Imazapyr: Using a conservative imazapyr exposure estimate that involves substantial drift to water (0.011 mg/L) and a NOAEC value for sensitive fish species (10.4 mg a.e./L) yields an HQ value of 0.001. This value is below the LOC which indicates that the herbicide formulation poses no significant risk to fish.

Triclopyr: Using a conservative triclopyr amine exposure estimate that involves substantial drift to water (0.003 mg a.e./L) and a 96-h NOAEL value for sensitive fish species (20 mg a.e./L) yields an HQ value of 0.0002. This value is below the LOC which indicates that the herbicide formulation poses no significant risk to fish.

***Central Valley Spring-Run Chinook Salmon ESU (Oncorhynchus tshawytscha)*, Chinook Salmon Sacramento River winter-run ESU (*Oncorhynchus tshawytscha*):** Central Valley spring-run Chinook salmon is listed as a State and Federal Threatened Species. Central Valley winter-run Chinook salmon is listed as a State and Federal Endangered Species. They are found in numerous creeks and on the Sacramento River (Figure 5). This anadromous species must pass through the lower segments of creek and river systems in order to reach spawning beds.

This evolutionarily significant unit, or ESU, includes naturally spawned spring-run and winter-run Chinook salmon originating from the Sacramento River and its tributaries, and also spring-run Chinook salmon from the Feather River Hatchery Spring-run Chinook Program. Chinook salmon use a variety of habitats during their lives. In general, water temperature determines their presence in a particular stream segment in freshwater. Preferred holding habitat is characterized by maximum weekly average temperatures less than 21ºC, although there is some evidence that CVS Chinook in some areas may tolerate slightly higher temperatures, such as in Butte Creek, tributary to the Sacramento River. The upper limit of temperature tolerance for adult CVS Chinook appears to be between 21 and 24ºC. Eggs are less tolerant, and thus adults wait until stream temperatures drop to around13-15°C in the fall before spawning, while juveniles are more tolerant that eggs or juveniles. Embryos are the most sensitive life stage, and have a narrow range of temperature tolerance, with considerable mortality occurring at temperatures above 14-16°C.

Adult CVS-run Chinook salmon migrate upstream during high runoff events starting in January or February. High flows, especially from snowmelt, allow adults to access higher elevation, smaller tributaries in April through June that are generally inaccessible to salmon at other times of the year. Adults seek out deep, cool pools in tributary streams less than 21°C (70°F) where these big fish hold over the summer before spawning in the fall. They prefer pools with plenty of cover, such as rock ledges, bubble curtains, and woody debris. Most spring-run Chinook adults in the Central Valley are four years old and average 78.5cm (31 in.). Juvenile spring-run Chinook spend varying amounts of time in freshwater before migrating to sea: 1) a matter of weeks after hatching, 2) a few months after hatching, or 3) an entire year or more in fresh water.

Adult SR winter-run Chinook Salmon pass under the Golden Gate Bridge to begin their spawning migration in November and continue upstream from December through early August. SR winter-run Chinook Salmon spawn in the upper mainstem Sacramento River from mid-April through August, peaking in June and July. Since spawning occurs during the warmest time of the year, adult spawners require stream reaches with plentiful cold, clean water that will protect embryos and juveniles from the warm ambient summer conditions. SR winter-run Chinook Salmon require water temperatures between 42.5 and 57.5 degrees Fahrenheit.

Sacramento River winter run Chinook salmon eat insects, amphipods, and other crustaceans while young, and mainly fish as adults.

Program work will be completed after spring and before winter run Chinook salmon occur. Program work will also occur prior to fall precipitation which normally provides adequate water to support adult migration or neonatal rearing during the the following season. Water temperatures are also estimated to be above the threshold of survival for salmonid species in the late summer and early fall months when Program work will occur. Program work typically does not occur in the low flow channel, as this portion of the riparian habitat is un-vegetated. All herbicides used by the project in riparian areas are also approved for use in wetlands with demonstrated low toxicity, posing no risk to fauna. Therefore, the Program will not result in a significant direct impact to Chinook salmon or steelhead and no mitigation is required.

Impact: No adverse impacts to Chinook salmon or steelhead are anticipated.

Steelhead trout (Oncorhynchus mykiss irideus): Steelhead trout is listed as a Federal Threatened Species. It is found in numerous creeks and on the Sacramento River (Figure 5). This anadromous species must pass through the lower segments of creek and river systems in order to reach spawning beds.

Steelhead can survive a wide range of temperature conditions, but require streams with adequate dissolved oxygen. Adult steelhead migrate from the ocean to freshwater spawning grounds. Spawning habitat consists of gravel substrates free of excessive silt. Adults do not feed during their upstream journey, rather use their energy reserves. Once they are large enough, smolts migrate downstream to the ocean, and to successfully complete this journey they require refuge areas with good cover and water quality.

Riparian vegetation provides cover and protection from predators and areas of refuge from high velocities. Riparian vegetation is also important in maintaining low stream temperature, stabilizing banks, and providing food sources for migrating steelhead. To provide these benefits, riparian vegetation needs high vigor, density, and species diversity, including a mixture of canopy trees, brush and grasses. Areas of lowered velocity or reverse flow areas within the channel allow steelhead to use energy reserves efficiently during migration in order to save energy for spawning. Sediment removal of sandbars reduces flow-field complexity, particularly of edgewater eddies and low velocity zones. This likely results in adult steelhead migrating through higher velocities and consuming higher levels of reserved energy. If too much reserved energy is consumed, and sufficient resting pools are not available, adults could be unable to reach spawning grounds, or have less energy for reproductive development. Furthermore, modification of sandbars and velocities could also simply increase the amount of time it takes for steelhead to reach spawning grounds. Removing and/or altering sandbars also reduces the convergence of flows through pools, thus reducing the processes that maintain pools. Pools provide cover and refuge. During the upstream migration steelhead rest in pools and during downstream migration smolts take refuge in pools during the day. Adults and smolts both require adequate flows for migration; they need enough water flow to travel up and down the river/stream, and to keep the river mouth open to the ocean.

Steelhead metabolism can be impacted by high water temperatures and the associated reduction in dissolved oxygen. Temperatures above 20° C have been known to stop fish migration, and temperatures above 25° C can be lethal to salmon and trout. High levels of suspended sediment (e.g. 3,000-4,000 mg/L), generally the result of large storm events or channel grading activities, can significantly impact fish migration and survival. Fish can suffer from gill abrasion and reduced visibility, and suffer mortality after exposure of two or more days. Fish at the mouth of a river would be delayed 1-2 days until the initial flush of sediment passes after a storm.

Adult steelhead migrate from the ocean into freshwater streams to spawn between December and April. Female steelhead dig a nest in a stream area with suitable gravel composition, water depth, and velocity. Females may deposit eggs in four to five nests. Steelhead eggs hatch three to four weeks after being deposited. Juvenile steelhead typically spend one to two years rearing in freshwater before migrating to estuarine areas as smolts and then into the ocean to feed and mature. The majority of smolts enter the ocean at age two in March and April. They migrate at

night and seek refuge and feed during the day. Steelhead can then remain at sea for up to three years before returning to fresh water to spawn.

They are born in fresh water streams, where they spend their first 1-3 years of life. They then emigrate to the ocean where most of their growth occurs. After spending between one to four growing seasons in the ocean, steelhead return to their native fresh water stream to spawn. Unlike Pacific salmon, steelhead do not necessarily die after spawning and are able to spawn more than once.

Program work will be completed after steelhead migration (both juvenile and adult life stages) occur. Program work will also occur prior to fall precipitation which normally provides adequate water to support adult migration or neonatal rearing during the the following season. Water temperatures are also estimated to be above the threshold of survival for salmonid species in the late summer and early fall months when Program work will occur. Program work typically does not occur in the low flow channel, as this portion of the riparian habitat is un-vegetated. All herbicides used by the project in riparian areas are also approved for use in wetlands with demonstrated low toxicity, posing no risk to fauna. Therefore, the Program will not result in a significant direct impact to Chinook salmon or steelhead and no mitigation is required.

Impact: No adverse impacts to Chinook salmon or steelhead are anticipated.

Amphibian Resources:

Fish are used as surrogates for larval amphibians by the EPA in pesticide risk assessment.

Glyphosate: Using a conservative glyphosate exposure estimate that involves substantial drift to water (0.011 mg a.e./L) and a 96-h NOAEL value for sensitive fish species (0.04 mg a.e./L) yields an HQ value of 0.3 (0.011/0.04). This value is below the LOC which indicates that the herbicide formulation poses no significant risk to non-target amphibians.

Imazapyr: Using a conservative imazapyr exposure estimate that involves substantial drift to water (0.011 mg/L) and a NOAEC value for sensitive fish species (10.4 mg a.e./L) yields an HQ value of 0.001 (0.011/10.4). This value is below the LOC which indicates that the herbicide formulation poses no significant risk to fish.

Triclopyr: Using a conservative triclopyr amine exposure estimate that involves substantial drift to water (0.003 mg a.e./L) and a 96-h NOAEL value for sensitive amphibian species (125 mg a.e./L) yields an HQ value of 0.00002 (0.003/125). This value is below the LOC which indicates that the herbicide poses no significant risk to non-target amphibians.

California Newt (Taricha torosa): California newt is a California species of special concern. This species has been found in eastern Tehama County. California newt is not expected to occur and would not be impacted.

Impact: No Impacts to California newt are anticipated.

Western Spadefoot (Spea hammondii): Western spadefoot is a California species of special concern. This species is occasionally found within southern Shasta and Tehama Counties, typically in vernal pool habitat. The species may also occur in other types of seasonal aquatic habitats as well. At the time of Program work activities, they will already be in a state of aestivation, buried underneath soil in areas outside of the active channel and immediate floodplain, where most of the treatment is expected to occur, and so are not expected to be impacted.

Impact: No Impacts to Western spadefoot are anticipated.

Foothill Yellow Legged frog (Rana boylii): Foothill yellow legged frog is a California species of special concern. Historically, this species was known to occur in most Pacific drainages from the Santiam River system in Oregon to the San Gabriel River system in California. Its known elevational range extends from near sea level to 2040 m. This frog has disappeared from much of its range in California (possibly up to 45 percent). Foothill yellow-legged frogs are known to occur within the Shasta and Tehama Counties, and it appears that they are fairly commonly found

during surveys that have occurred, particularly in the upper watersheds. Surveys conducted by Dr. Gary Fellers in the lower Cottonwood Creek watershed also found them to be present, with reduced or no observations in areas inhabited by bullfrogs. Similarly, this species has been commonly found within adjacent watersheds (e.g. Clear Creek), so it can be assumed that the population is in relatively good condition.

The species requires shallow, flowing water, apparently preferentially in small to moderate-sized streams situations with at least some cobble-sized substrate. This type of habitat is probably best suited to oviposition and likely provides significant refuge habitat for larvae and postmetamorphs. Foothill yellow-legged frogs have been found in stream situations lacking a cobble or larger-sized substrate, but it is not clear whether such habitats are regularly utilized. Foothill yellow-legged frogs are infrequent or absent in habitats where introduced aquatic predators (i.e., various fishes and bullfrogs (*Rana catesbeiana*)) are present. Reproduction is aquatic. Fertilization is external. Mating and egg-laying occurs in streams and rivers (not ponds or lakes) from April until early July, after streams have slowed from winter runoff. In California, researchers have found egg masses between April 22 and July 6, with an average of May 3. Clusters of eggs are laid on the downstream side of rocks in shallow slow-moving water where they are attached to submerged rocks and pebbles and occasionally vegetation. Eggs can number from 300- 2,000, averaging 900. Egg masses are often covered with a layer of silt, which probably helps to hide them from predators. Eggs hatch within 5 - 37 days, depending on water temperature.

Tadpoles remain around the egg mass for a about a week, then they move away to feed, using rocks and gravel for cover. Tadpoles transform in 3 to 4 months, typically from July to October. Newly metamorphosed juveniles typically migrate upstream from the hatching site. Two years are thought to be required to reach adult size, but no data are available on longevity. Until data indicate otherwise, habitat critical to the survival of *R. boylii* should be identified in part by the presence of oviposition habitat having riffle areas with a substrate of cobble-sized or larger rocks.

Water released from reservoirs, that washes away eggs and tadpoles and forces adult frogs away from the streams leaving them more vulnerable to predators, is a serious problem for frogs in the Sierra Nevada foothills. Air-borne pesticides from agricultural fields of the Central Valley are also likely to be a primary threat. Recreational activities along streams that alter streambeds are also having a negative impact on frog populations in the Sierra foothills. Introduced fish also stress frog populations by consuming eggs and tadpoles, and introduced bullfrogs compete for food and eat the frogs. Habitat loss, disease, introduced crayfish, stream alteration from dams, mining, logging, and grazing, are also threats to this frog.

Herbicide applications may alter the terrestrial vegetation and invertebrate communities on which ranid frogs depend, though any minor short-term impacts would be offset by a decrease in invasive plant species. Vegetation changes, as a result of nonnative plant removal, are anticipated to have a long term benefit to frog habitat. Plants such as giant reed and salt cedar, for example, do not contribute suitable woody debris to create habitat for amphibians that utilize deep pools or cover that could be created by woody debris, not to mention the food that comes from woody debris and (native vegetation) leaf litter. Because the treatment areas are relatively scattered the overall effect to vegetative cover, is expected to be minimal and not affect the non-aquatic habitat needed by the species. With the removal of giant reed, in particular, reduction in erosion and fine sediment will improve instream conditions for foothill yellow-legged frogs, which is composed of gravel, pebbles, and large rocks, not fine sediment. Normalization of flood processes and fire risk reduction will also benefit the species.

Because the Program work activity period is in late summer/fall, the life phase most potentially affected by the Program is the metamorphic period during which tadpoles obtain an adult frog form. In addition, adult frogs could be in the area, particularly those portions of Creeks that still have flowing water. Direct impacts may occur if an adult or juvenile frogs are unintentionally harassed during the treatment process.

Impact Bio-2: Disturbance-related impacts to foothill yellow-legged frog would be significant. With incorporation of Mitigation Measures BIO-2 and BIO-3 this impact will be reduced below a level of significance:

Bio-2: To reduce disturbance-related impacts to foothill yellow-legged frog (*Rana boylii*), the WSRCD Program Manager shall direct crews to minimize disturbances in areas where any foothill yellow-legged frog are observed. Treatment of these areas may proceed under the following circumstances: 1) areas occupied by foothill yellow-legged frog or with active stream flow shall be treated later in the season (August 15 to Nov 15, or as dictated by

CDFW under the Programs Streambed Alteration Permit), when flows have ceased or the frogs have left the area; or 2) pursue an alternate plan that avoids harassment/mortality and minimizes other physical habitat disturbances in coordination with the written permission of the California Department of Fish and Game's Northern Region Lake and Streambed Alteration Agreement Program. The WSRCD Program Manager shall demonstrate compliance with this measure through the submission of annual reports due to the California Department of Fish and Game's Northern Region Lake and Streambed Alteration Agreement Program no later than May 31of each year that the Program is implemented.

Bio-3: To reduce wildlife disturbance, the WSRCD Program Manager shall direct crews to avoid spraying in the presence of wildlife observed in the treatment areas. Areas that are not sprayed due to the presence of wildlife may be sprayed once wildlife have left the treatment area. Areas with suspected occupied nesting or denning habitats shall also be avoided and not treated using manual plant removal methods or herbicides until wildlife have left the area. The WSRCD Program Manager shall demonstrate compliance with this measure through the submission of annual reports due to the California Department of Fish and Game's Northern Region Lake and Streambed Alteration Agreement Program no later than May31of each year that the Program is implemented.

Impact: No Impacts to California yellow-legged frog are anticipated.

California Red-Legged Frog (Rana aurora draytonii): The California red-legged frog (CARLF) is listed as Threatened under by USFWS and is a California species of special concern. CARLF is threatened by human activities, many of which operate synergistically and cumulatively with each other and with natural disturbances (i.e., droughts or floods). Factors associated with declining populations of the frog include degradation and loss of its habitat through agriculture, urbanization, mining, overgrazing, recreation, timber harvesting, non-native plants, impoundments, water diversions, degraded water quality, use of pesticides, and introduced predators. The reason for decline and degree of threats vary by geographic location. California red-legged frog populations are threatened by more than one factor in most streams.

Historically, CARLF was found in 46 counties. The range extended coastally from the vicinity of Point Reyes National Seashore, Marin County, and inland from the vicinity of Redding, Shasta County, south to northwestern Baja California, Mexico. The frog has sustained a 70 percent reduction in its geographic range in California as a result of habitat loss and alteration, overexploitation, and introduction of exotic predators. Today, only 26 counties support known populations. CARLF is found primarily in coastal drainages of central California. Monterey, San Luis Obispo and Santa Barbara counties support the greatest amount of currently occupied habitat. Only four areas within the entire historic range of this species may currently harbor more than 350 adults (USFWS 2002).

CARLF is the largest native frog in the western United States, ranging in size from 1.5 to 5 inches long. The bodies of adult females are approximately one inch longer than those of adult males. CARLF has been found from sea level to about 5,000 feet and may be found in a variety of habitats. During wet weather, frogs may move through upland habitats. Frogs spend considerable time resting and feeding in riparian habitat. They eat mostly invertebrates, and they feed at night. CARLF is a relatively prolific breeder, usually laying egg masses during or shortly following heavy rainfall in late winter or early spring. The species breeds in aquatic habitats such as streams, ponds, marshes and stock ponds. Females can lay between 2,000 and 5,000 eggs in a single mass. The eggs are attached to bulrushes or cattails. CARLF breeds from November through March with earlier breeding records occurring in southern localities. Northern red-legged frogs (*Rana aurora aurora*) breed in January to March soon after the ice melts. It takes 6 to 14 days for the eggs to hatch and approximately 11-20 weeks of permanent water to reach metamorphosis into frogs. The highest rates of mortality for this species occur during the tadpole stage: less than one percent of eggs hatched reach adulthood.

CARLF is typically found in slow flowing portions of perennial streams and in intermittent streams that maintain water in the summer months. Suitable habitat is also characterized by dense, shrubby riparian vegetation associated with deep (< 0.7 m), still or slow-moving water (Jennings 1988, Hayes and Jennings 1988). This species is also found in ponds or in hillside seeps that maintain pool environments or saturated soils throughout the summer months. Shrubby riparian vegetation that structurally seems to be most suitable for CARLF is that which is provided by arroyo willow (*Salix lasiolepis*); cattails (*Typha* sp.) and bulrushes (*Scirpus* sp.) (Jennings 1988). Although California red-legged frogs can occur in ephemeral or permanent streams or ponds, populations probably cannot be maintained in ephemeral streams in which all surface water disappears. Water should have a salinity of < 4.5 ‰ to

ensure the survival of embryonic stages (Jennings and Hayes 1988). Juvenile frogs seem to favor open, shallow aquatic habitats with dense submergent vegetation (WSRCD2008).

Populations of CARLF will be reduced or eliminated from aquatic habitats supporting non-native species such as bullfrogs (*Rana catesbeiana*), Centrarchid fish species (such as sunfish, blue gill, or large-mouth bass), and signal and red swamp crayfish, all of which are known CARLF predators. However, the presence of these non-native species does not preclude the presence of CARLF.

Existing records indicate CARLF has not been observed in the Central Valley since 1957, and a breeding population has not been found since 1947 (Jennings et al., 1992). Per Jennings and Hayes (1994), CARLF is assumed extirpated from the Central Valley. There was, however, a sighting of a CARLF approximately 25 miles west to southwest of the Program Area (in the Tehama County foothills, Sunflower Gulch) in 1994. Numerous additional surveys since that time have not discovered any additional individuals (USFWS 2002; B. Burroughs, pers. communication, 2011).

Based upon recent studies conducted by Dr. Gary Fellers (2007), CARLF move towards breeding ponds with the onset of heavy winter rains. Frogs depart from breeding ponds at varying times throughout the rainy season, with some frogs remaining at permanent ponds all year. Some frogs will make large-scale movements during the dry season (May through October), as seasonal breeding sites dried. Frogs at the main study site moved a median distance of 150 m, roughly the distance to the nearest suitable non-breeding area. The greatest straight-line distance traveled was 1.4 km, although the presumed distance traveled by that frog was 2.8 km. Most frogs that dispersed from breeding ponds crossed a grazed pasture to a riparian area where they stayed through the non-breeding season; only a few individuals moved primarily along a creek.

Cottonwood Creek itself was potentially used historically as a dispersal corridor for CARLF, although the potential for frogs to be currently present is highly unlikely (there are very few sightings of the species in Tehama and/or Shasta Counties) (Bratcher-c, 2007). However, there is limited suitable habitat in the Program Area (creek and immediate floodplain) for egg laying/reproduction. Due to the stream's propensity for flows going subsurface by late summer, particularly in areas between the Bowman Road bridge and the main stem Cottonwood Creek confluence, this particular area is not considered to be as suitable. The Program area itself is subject to high levels of predation by fish and bullfrogs, either in the channel or in adjacent ponds/small lakes (Fellers 2007). Instream habitat above the Highway 36 confluence tends to have perennial flow and contains areas where there is more suitable habitat for use by all life stages of CARLF.

There are ponds/lakes within the Program area that could provide suitable egg-laying habitat. Review of aerial photos revealed several ponds within the Program area, scattered along the length of the entire Program Area. The closest is within 0.1 miles, and others lie at least a mile from the stream edge. Some of these were surveyed for CARLF in 2006 and 2007 by researchers with the U.S. Geological Survey (Fellers 2007) as part of a watershed-wide survey effort. Based upon aerial photo analysis and their observations, these and other ponds could be suitable habitat.

CARLF are assumed to occur within the Cottonwood Creek watershed (USFWS Recovery Plan 2002). One recorded sighting of CARLF was documented in an adjacent watershed (to the south). Based upon lack of surveys to protocol for CARLF, CARLF presence cannot be dismissed. However, surveys conducted by Dr. Gary Fellers in the lower Cottonwood Creek watershed did not record their presence. In addition, the surveys documented extensive presence of bullfrogs (*Lithobates catesbeianus*) within the Program and Program areas (Fellers 2007), which would further reduce the potential for presence by CARLF. There is also limited habitat within the Program area that meet the criteria, at that time of the year, for suitable habitat. Suitable habitat at that time frame becomes restricted to areas above the Highway 36 bridge over South Fork Cottonwood Creek and ponds that occur within a mile of the creek. In the area between Pettyjohn Road Bridge and Highway 36, the number of pools with suitable depth were very limited (Bratcher 2011). No CARLF have been observed in Shasta County. Therefore, the potential for presence of CARLF in the Program Area, and particularly in areas with the highest level of Program activity, is expected to be extremely low.

Removal of the target non-native invasive species will have a long-term beneficial effect on habitat for CARLF, particularly those riparian habitat features that provide cover (e.g. overhanging vegetation). Glyphosate, imazapyr and triclopyr application is an effective means of controlling invasive plant species that degrade CARLF habitat, while posing very low toxicity to amphibians (HQ <1). Because the target non-native invasive species in question

cannot be controlled by grazers (cattle, sheep, goats), manual removal, or biocontrol, herbicide application is the only effective means of control.

Vegetation changes, as a result of non-native plant removal, is anticipated to have a long-term benefit to frog habitat. Plants such as *Arundo* and salt cedar, for example, do not contribute suitable woody debris to create habitat for amphibians that utilize deep pools or cover that could be created by woody debris, not to mention the food that comes from woody debris and (native vegetation) leaf litter. Because the treatment areas are relatively scattered, and the target stands of vegetation small, the overall effect to vegetative cover, is expected to be minimal and not affect the non-aquatic habitat needed by the species.

Impact: No Impacts to California red-legged frog are anticipated.

Special Status Reptile Resources:

The USEPA generally uses birds as surrogates for reptiles in herbicide risk assessment.

Glyphosate: The NOAEL for birds is 540 mg a.e./kg. and an exposure estimate involving the consumption of contaminated vegetation (29.6 mg a.e./kg) are used, the resultant HQ is 0.05 (29.6/540). This value is below the LOC which indicates that the herbicide formulation poses no significant risk to non-target reptiles.

Imazapyr: The NOAEL for birds is above 2,510 mg a.e./kg (no signs of toxicity, higher rates not tested) and an exposure estimate involving the consumption of contaminated vegetation (29.6 mg a.e./kg) are used, the resultant HQ is 0.01 (29.6/2,510). This value is below the LOC which indicates that the herbicide formulation poses no significant risk to non-target reptiles.

Triclopyr: The NOAEL for birds is 126 mg a.e./kg and an exposure estimate involving the consumption of contaminated vegetation (40.5 mg a.e./kg) are used, the resultant HQ is 0.3 (40.5/126) . This value is below the LOC which indicates that the herbicide formulation poses no significant risk to non-target reptiles.

Western Pond turtle (Emys marmorata): The western pond turtle is a California species of special concern. It historically occurred in Washington, Oregon, California, and Baja California, and had a relatively continuous distribution within California principally west of the Sierra-Cascade crest. Western pond turtle is the subspecies found in western United States. This species population is currently at a fraction of their historical levels. They nevertheless occur throughout much of their historical range. Although a USFWS determination in 1992 found that listing under the ESA was not warranted, and is considered a Species of Special Concern in California.

Within California, the Central Valley is thought to have supported the highest historical concentrations of western pond turtle. The conversion of native wetlands and floodplains for urban and agricultural uses has eliminated most of the turtle's habitat of the Central Valley. Western pond turtle numbers are greatly reduced, but the species is thought to still occur in rivers, backwaters, and wetlands of roughly 90 percent of its historical range, including perennially flowing rivers in the Central Valley. Expansion of agriculture and other development in upland areas has probably adversely affected nesting habitat and connectivity.

Although primarily an aquatic reptile, the western pond turtle needs terrestrial habitat for basking, overwintering, nesting, and traveling between ephemeral sources of water. Available data do not provide any clear indication of what percentage overwinters in the mud (i.e., underwater) versus on land. Breeding activity peaks in May through July but may occur throughout the year. Western pond turtles are philopatric, which implies that continuity of nesting habitat from year to year may be an important consideration. This turtle has a low fecundity, laying 1–14 eggs per clutch. The species incubation period averages 80 days (mainly starting in June–July), but in some cases may exceed 100 days in California. Incubating eggs are extremely sensitive to increased soil moisture, which can cause high mortality. In colder climates, hatchlings may often overwinter in their nests, emerging in the following spring. In warmer climates, such as southern and central California, hatchlings tend to emerge from the nest in the early fall. Hatchlings spend much of their time in shallow water, within dense vegetation of submergent or short emergent macrophytes. Hatchling and juvenile survivorship is considered to be low (Holland 1994). Western pond

turtles in California reach sexual maturity in 7 to 11 years. Twenty-five years is generally considered to be the rough upper limit on age for most adults in natural settings.

The Western pond turtle inhabits a wide range of fresh or brackish water habitats including ponds, lakes, ditches, perennially filled pools of intermittent streams, and backwater and low-flow areas of perennial streams and rivers. A key requirement is proximity to potential nesting sites. Females build nests between 2.4 to 4.7 in (6 to 12 cm) deep, in dry clayey, loamy, or silty soils, on gentle (< 15 percent), south- or west-facing slopes, at distances ranging from 4.9 to 1,320 ft (1.5 to 402 m) (average=148 ft [45 m]) away from water. Nests are generally located in grassy meadows, away from trees and shrubs, with canopy cover commonly less than about 10 percent. Western pond turtles are not especially strong swimmers. Suitable aquatic habitats generally have standing (lentic) and slow-moving (lotic) water, which, on the Sacramento River and other large, lowland alluvial rivers typically occurs in off-channel areas, such as oxbows and sloughs. Overwintering in terrestrial habitats may be an adaptation which helps Western pond turtles escape high winter flows in lotic waters. On the Trinity River, in un-dammed riverine habitat, Western pond turtles appear to prefer deep, lotic water, moderate amounts of riparian vegetation, warm water and/or ample basking sites, LWD and rocks which provide underwater cover from predators such as otters and minks. In addition to physical habitat conditions, predation pressure has been shown to influence the distribution of Western pond turtles. A case in point comes from studies in the San Simeon area of coastal California, in which fewer Western pond turtles were observed when raccoon numbers were high. Raccoons are an important predator of Western pond turtles and are known to prey on adults as well as juveniles.

Whereas adults and older juveniles are considered aquatic habitat generalists, hatchlings and young juveniles require specialized habitat for survival through their first few years. For example, in addition to requiring low-flow and backwater areas of rivers, hatchlings need to spend much of their time feeding in shallow water amongst dense submergent and short emergent vegetation, presumably to avoid predators. Habitats preferred by juveniles are generally scarce and may be especially sensitive to anthropogenic and natural disturbances.

Western pond turtle is poikilothermic ("cold-blooded") and generally must spend a portion of each day basking, either on land or in thermal aquatic refugia. Terrestrial basking sites may include rocks, logs, banks, emergent vegetation, root masses, open banks, and tree limbs. Deep (> 1.6 ft [0.5 m]), still water with emergent woody debris, overhanging vegetation, and rock outcrops provide optimal basking habitat for older Western pond turtle life stages. In addition to the large-scale loss of habitat, many other factors have likely contributed to declines in Western pond turtle populations. These include introduced predators and competitors, increased numbers of native predators, disease, reduced water quality, habitat fragmentation, permanent and seasonal barriers to movement and gene flow, along with habitat alterations caused by invasive plants. Another potentially important limiting factor for the Western pond turtle is the relationship between water level and flow in off-channel water bodies. This is because incubating eggs are extremely sensitive to increased soil moisture.

This turtle is known to exist within the Program Area. There are numerous observations of them in the South Fork Cottonwood Creek watershed, including direct observations of adult turtles resting along the stream bottom above the Highway 36 Bridge. These turtles were observed during a target non-native invasive plant survey conducted in July, 2011. Suitable habitat exists throughout the Program Area, so the potential for the presence of turtles, depending on life stage, is high. The timing of the Program (August 15 to Nov 15, or as dictated by CDFW under the Programs Streambed Alteration Permit) coincides with turtles of various ages being present in the water; nests in or near the streambank; and/or turtles moving into the areas near the stream to either sun themselves or potentially begin hibernating. Depending on air temperature, eggs laid in the summer may hatch by October, and the hatchlings will either (1) stay in the nest until spring, or (2) move out of the nest and into the water.

While it is acknowledged there may be some risk of negative effects to western pond turtle due to the Program, control of the target non-native invasive will have a long-term beneficial effect on habitat for Western pond turtle, particularly those riparian habitat features that provide cover (e.g. overhanging vegetation) and basking areas (native trees that fall over into the stream/pools). Impacts to Western pond turtle could result from trampling of nests, increased predation risk due to loss of vegetative cover, spraying turtles with herbicide (although as indicated above, all chemicals used have very low toxicity for reptiles), and reduced suitability of hibernating areas. It is acknowledged that if water is not present, then the likelihood of turtles being present is low. However, that does not discount the potential for a female turtle to have built a nest earlier in the summer when water was present.

Impact Bio-3: Disturbance-related impacts to western pond turtle would be significant. With incorporation of Mitigation Measure BIO-3 this impact will be reduced below a level of significance.

Bio-3: To reduce wildlife disturbance, the WSRCD Program Manager shall direct crews to avoid spraying in the presence of wildlife observed in the treatment areas. Areas that are not sprayed due to the presence of wildlife may be sprayed once wildlife have left the treatment area. Areas with suspected occupied nesting or denning habitats shall also be avoided and not treated using manual plant removal methods or herbicides until wildlife have left the area. The WSRCD Program Manager shall demonstrate compliance with this measure through the submission of annual reports due to the California Department of Fish and Game's Northern Region Lake and Streambed Alteration Agreement Program no later than May31of each year that the Program is implemented.

Avian Resources

Toxicological risk assessment summaries for different bird sizes and life histories are presented below:

SMALL BIRDS:

Glyphosate: The NOAEL for birds is 540 mg a.e./kg. An exposure scenario that involves the ingestion of contaminated water (0.0029 mg a.e./kg/day) yields a HQ value of 0.000005 (0.0029/540), and a scenario that involves the consumption of contaminated insects (37.7 mg a.e./kg/day) yields an HQ value of 0.07 (37.7/540). While there is no exposure estimate available for small birds consuming contaminated vegetation, the large bird exposure scenario (29.6 mg a.e./kg/day) produces an HQ value of 0.05 (29.6/540). All of these calculated HQ values are below the LOC which indicates that the herbicide formulation poses no significant risk to small birds via exposure to contaminated water, insects or vegetation.

Imazapyr: The NOAEL for birds is above 2,510 mg a.e./kg (no signs of toxicity, higher rates not tested). An exposure scenario that involves the ingestion of contaminated water (0.0029 mg a.e./kg/day) yields a HQ value of 0.000001 (0.0029/2,510), and a scenario that involves the consumption of contaminated insects (37.7 mg a.e./kg/day) yields an HQ value of 0.015 (37.7/2,510). While there is no exposure estimate available for small birds consuming contaminated vegetation, the large bird exposure scenario (29.6 mg a.e./kg/day) produces an HQ value of 0.01 (29.6/2,510). All of these calculated HQ values are below the LOC which indicates that the herbicide formulation poses no significant risk to small birds via exposure to contaminated water, insects or vegetation.

Triclopyr: The NOAEL for birds is 126 mg a.e./kg and an exposure estimate involving the consumption of contaminated vegetation (40.5 mg a.e./kg) are used, the resultant HQ is 0.3 (40.5/126) . This value is below the LOC which indicates that the herbicide formulation poses no significant risk to non-target reptiles.

LARGE BIRDS:

Glyphosate: The NOAEL for birds is 540 mg a.e./kg. An exposure scenario that involves the ingestion of contaminated water (0.0004 mg a.e./kg/day) yields an HQ value of 0.0000007. (0.0004/540), and a scenario that involves the consumption of contaminated insects (37.7 mg a.e./kg/day) yields an HQ value of 0.07 (37.7/540). The consumption of contaminated vegetation (29.6 mg a.e.,/kg/day) produces an HQ value of 0.05 (29.6/540). All of these calculated HQ values are below the LOC which indicates that the herbicide formulation poses no significant risk to large birds via exposure to contaminated water, insects or vegetation.

Imazapyr: The NOAEL for birds is above 2,510 mg a.e./kg (no signs of toxicity, higher rates not tested). An exposure scenario that involves the ingestion of contaminated water (0.0029 mg a.e./kg/day) yields a HQ value of 0.000001 (0.0029/2,510), and a scenario that involves the consumption of contaminated insects (37.7 mg a.e./kg/day) yields an HQ value of 0.015 (37.7/2,510). The consumption of contaminated vegetation (29.6 mg a.e.,/kg/day) produces an HQ value of 0.01 (29.6/2,510). All of these calculated HQ values are below the LOC which indicates

that the herbicide formulation poses no significant risk to large birds via exposure to contaminated water, insects or vegetation.

Triclopyr: The NOAEL for birds is 126 mg a.e./kg and an exposure estimate involving the consumption of contaminated vegetation (40.5 mg a.e./kg) are used, the resultant HQ is 0.3 (40.5/126) . This value is below the LOC which indicates that the herbicide formulation poses no significant risk to non-target reptiles.

CARNIVOROUS BIRDS:

Glyphosate: Using the NOAEL value of 540 mg a.e./kg and an estimated exposure value of 3.23 mg a.e./kg produces an HQ value of 0.006. This value is below the LOC which indicates that the herbicide formulation poses no significant toxicological risk to carnivorous birds that consume small mammal prey that have received direct applications of the herbicide.

Imazapyr: Using the NOAEL value of 2,510 mg a.e./kg and an estimated exposure value of 3.23 mg a.e./kg produces an HQ value of 0.001. This value is below the LOC which indicates that the herbicide formulation poses no significant toxicological risk to carnivorous birds that consume small mammal prey that have received direct applications of the herbicide.

Triclopyr: The NOAEL for birds is 126 mg a.e./kg and an exposure estimate involving the consumption of contaminated vegetation (40.5 mg a.e./kg) are used, the resultant HQ is 0.3 (40.5/126) . This value is below the LOC which indicates that the herbicide formulation poses no significant risk to non-target reptiles.

FISH EATING BIRDS:

Glyphosate: Using the NOAEL value of 540 mg a.e./kg and an estimated exposure value of 0.000572 mg a.e./kg produces an HQ value of 0.000001. This value is below the LOC which indicates that the herbicide formulation poses no significant toxicological risk to fish-eating birds that consume herbicide-contaminated prey.

Imazapyr: Using the NOAEL value of 2,510 mg a.e./kg and an estimated exposure value of 0.000572 mg a.e./kg produces an HQ value of 0.0000002. This value is below the LOC which indicates that the herbicide formulation poses no significant toxicological risk to carnivorous birds that consume small mammal prey that have received direct applications of the herbicide.

Triclopyr: The NOAEL for birds is 126 mg a.e./kg and an exposure estimate involving the consumption of contaminated vegetation (40.5 mg a.e./kg) are used, the resultant HQ is 0.3 (40.5/126) . This value is below the LOC which indicates that the herbicide formulation poses no significant risk to non-target reptiles.

Herbicide Treatments will occur predominantly after most bird species present in the area have nested and/or fledged their young (field work August 15 to Nov 15, or as dictated by CDFW under the Programs Streambed Alteration Permit). Some level of temporal disturbance will occur due to human presence and noise from equipment, but this is expected to be short in duration and low in intensity. Some loss of forage may occur temporarily either by insects that occur on the target non-native invasive plant species or attributable to incidental impact to native riparian vegetation due to very minor amounts of drift or cutting of native vegetation back that is anticipated in order to treat target non-native invasive plants. This temporal negative effect is likely to be offset by the regrowth of native vegetation in the treated areas which creates long term beneficial effects. Program work will be completed within riparian areas. Special-status avian species are discussed below.

RAPTORS:

The following raptor species have special status and are known/suspected to occur within the Program Area:

California Fully-Protected: White-Tailed Kite (*Elanus leucurus*), and Bald Eagle (*Haliaeetus leucocephalus*) (also state listed as California Endangered and protected by the Federal Eagle Protection Act)
California Threatened: Swainson's Hawk (*Buteo swainsoni*)
Species of Special Concern: Northern Harrier (*Circus cyaneus*)**,** Long-Eared Owl (*Asio otus*), and Short-Eared Owl (*Asio flammeus*)

Special-status raptors will not be nesting during the Program implementation time frame (field work August 15 to Nov 15, or as dictated by CDFW under the Programs Streambed Alteration Permit), thus avoiding disturbance; they do not typically nest in target non-native invasive plant stands and/or in vegetation potentially affected and will not lose any habitat as a result of target non-native invasive plant removal; and/or have been infrequently detected within the Program Area. During the latter period of Program implementation, two of these species (harrier and eagle) will likely be absent due to their migration patterns.

The indirect effect of loss of some herbaceous cover to their prey base (e.g. birds using vegetation for nesting or foraging) is expected to be minimal and widely distributed over the landscape. Bird species that are potential prey to raptors also do not prefer to use giant reed, salt cedar, rattlebox, or tree-of-heaven for foraging or nesting (Pers. communication, Alicia Young, PRBO, and May 8, 2012), so the loss of that vegetation is not expected to negatively affect these species. Sites to be treated are typically composed of individual plants, or small patches of plants of moderate height, which limits any potential exposure to disturbance in very small areas.

Impact: Impacts to raptors are below a level of significance.

NON-RAPTOR, MIGRATORY AND RESIDENTIAL BIRDS:

The following passerine bird species have special status and are known/suspected to occur within the Program Area:

California Endangered

Willow Flycatcher (*Empidonax traillii*), and Western Yellow-Billed Cuckoo (*Coccyzus americanus occidentalis*)

California Species of Special Concern
Black Tern (*Chlidonias niger*), Vaux's Swift (*Chaetura vauxi*), Olive-Sided Flycatcher (*Contopus cooperi*), Purple Martin (*Progne subis*), Loggerhead Shrike (*Lanius ludovicianus*), Yellow Warbler (*Dendroica petechia brewsteri*), Yellow-Breasted Chat (*Icteria virens*), Grasshopper Sparrow (*Ammodramus savannarum*), Tricolored Blackbird (*Agelaius tricolor*)

These species will likely not be nesting during the Program implementation time frame (field work August 15 to Nov 15, or as dictated by CDFW under the Programs Streambed Alteration Permit), thereby avoiding disturbance; are known to migrate through the Program area and so have limited exposure; and/or have been infrequently detected within the Program area. During the latter period of Program implementation, most of these species will potentially be completely gone due to earlier fall migration.

Indirect effects related to the loss of some herbaceous cover to the nesting, dispersal, or foraging habitat is expected to be minimal and widely distributed over the landscape, typically in areas with poor/sparse cover. The aforementioned bird species do not prefer to use giant reed, salt cedar, or tree-of-heaven for foraging or nesting (Pers. communication, Alicia Young, PRBO, May 8, 2012), so the loss of that vegetation is not expected to negatively affect these species. In the unlikely event that late-season nests are encountered, impacts to nesting birds would be considered significant.

Impact Bio-3: Impacts to nesting birds would be significant.
With incorporation of Mitigation Measure BIO-3 this impact will be reduced below a level of significance.

Bio-3: To reduce wildlife disturbance, the WSRCD Program Manager shall direct crews to avoid spraying in the presence of wildlife observed in the treatment areas. Areas that are not sprayed due to the presence of wildlife may

be sprayed once wildlife have left the treatment area. Areas with suspected occupied nesting or denning habitats shall also be avoided and not treated using manual plant removal methods or herbicides until wildlife have left the area. The WSRCD Program Manager shall demonstrate compliance with this measure through the submission of annual reports due to the California Department of Fish and Game's Northern Region Lake and Streambed Alteration Agreement Program no later than May31of each year that the Program is implemented.

Bank Swallow (Riparia riparia): Bank swallow is listed as Threatened under CESA. This neotropical migrant is found primarily in riparian and other lowland habitats of California during the spring-fall period. During the summer months the species is restricted to riparian, lacustrine, and coastal areas with vertical banks, bluffs, and cliffs with fine-textured or sandy soils, into which it digs nesting holes. In migration, bank swallow flocks with other swallows over many types of open habitat. It is estimated that approximately 75 percent of the current breeding population in California occurs along banks of the Sacramento and Feather rivers and some of its tributaries in the northern Central Valley. The Bank Swallow feeds on a wide variety of aerial and terrestrial soft-bodied insects including flies, bees, and beetles predominantly over open riparian areas, but also over brushland, grassland, wetlands, water, and cropland. It uses burrows dug in cliffs and river banks for cover.

Predominantly a colonial breeder, Bank Swallow nesting colonies are normally located on vertical banks and cliffs with fine-textured or sandy soils near streams, rivers, ponds, lakes, and the ocean and contain between 100 and 200 nesting pairs. Feeding occurs over grassland, shrubland, savannah, and open riparian areas during breeding season and over grassland, brushland, wetlands, and cropland during migration. Burrows are 1" to 2.2" wide and up to 54" deep. A small chamber at end of burrow contains the nest. Burrows and nests are lined with grasses, other plant material and feathers. Breeding occurs between early May through July, with peak activity from mid-May to mid-June. Eggs and adults are preyed upon by rats, skunks, house cats, snakes, and some raptors. In California, however, gopher snakes (*Pituophis melanoleucus*) and American kestrels (*Falco sparverius*) are the most common predators. Channelization and stabilization of banks of nesting rivers, and other destruction and disturbance of nesting areas, are major factors causing the marked decline in numbers in recent decades. It is anticipated that the removal of *Arundo* stands will reduce the amount of flood flows that are redirected to adjacent banks which cause cutting and erosion of bank structures suitable for bank swallow nesting sites, normalizing and benefiting bank swallow habitat. Bank swallows occur at multiple locations along the Sacramento River (Figure 3-4). Cliff swallows will likely not be nesting during the Program implementation time frame (field work August 15 to Nov 15, or as dictated by CDFW under the Programs Streambed Alteration Permit), thereby avoiding disturbance; are known to migrate through the Program area and so have limited exposure. To assure no impacts occur, MM Bio-3 will be followed.

Impact Bio-3: Impacts to bank swallow would be significant.
With incorporation of Mitigation Measure BIO-3 this impact will be reduced below a level of significance.

Bio-3: To reduce wildlife disturbance, the WSRCD Program Manager shall direct crews to avoid spraying in the presence of wildlife observed in the treatment areas. Areas that are not sprayed due to the presence of wildlife may be sprayed once wildlife have left the treatment area. Areas with suspected occupied nesting or denning habitats shall also be avoided and not treated using manual plant removal methods or herbicides until wildlife have left the area. The WSRCD Program Manager shall demonstrate compliance with this measure through the submission of annual reports due to the California Department of Fish and Game's Northern Region Lake and Streambed Alteration Agreement Program no later than May31of each year that the Program is implemented.

Special Status Mammal Resources:

SMALL MAMMALS (20g):

Glyphosate: The glyphosate NOAEL for mammals is 175 mg a.e./kg. An exposure scenario that involves the ingestion of contaminated water (0.00161 mg a.e./kg) yields a HQ value of 0.000009 (0.00161/175), and a scenario that involves the consumption of contaminated insects (23.1 mg a.e./kg) yields an HQ value of 0.1 (23.1/175). The most conservative exposure estimate for small mammals consuming contaminated vegetation (grass) is 14.3 mg

a.e./kg/day. The calculated HQ value for this exposure scenario is 0.08 (14.3/175). These calculated HQ values are below the LOC which indicates that the herbicide formulation poses no significant risk to small mammals via exposure to contaminated water, contaminated insect prey or contaminated vegetation.

Imazapyr: The imazapry NOAEL for mammals is 738 mg a.e./kg. An exposure scenario that involves the ingestion of contaminated water (0.00161 mg a.e./kg) yields a HQ value of 0.000002 (0.00161/738), and a scenario that involves the consumption of contaminated insects (23.1 mg a.e./kg) yields an HQ value of 0.03 (23.1/738). The most conservative exposure estimate for small mammals consuming contaminated vegetation (grass) is 14.3 mg a.e./kg/day. The calculated HQ value for this exposure scenario is 0.02 (14.3/738). These calculated HQ values are below the LOC which indicates that the herbicide formulation poses no significant risk to small mammals via exposure to contaminated water, contaminated insect prey or contaminated vegetation.

Triclopyr: The triclopyr amine NOAEL for small mammals is 440 mg a.e./kg. An exposure scenario that involves the ingestion of contaminated water (0.000439 mg a.e./kg) yields a HQ value of 0.000001 (0.000439/440), and a scenario that involves the consumption of contaminated insects (19.3 mg a.e./kg) yields an HQ value of 0.04 (19.3/440). The most conservative exposure estimate for small mammals consuming contaminated vegetation (grass) is 144 mg a.e./kg/day. The calculated HQ value for this exposure scenario is 0.3 (144/440). These calculated HQ values are below the LOC which indicates that the herbicide poses no significant risk to small mammals via exposure to contaminated water, contaminated insect prey or contaminated vegetation.

MEDIUM TO LARGE MAMMALS (400 g):

Glyphosate: The glyphosate NOAEL for mammals is 175 mg a.e./kg. An exposure scenario that involves the ingestion of contaminated water (0.000712 mg a.e./kg) yields an HQ value of 0.000004. (0.000712/175), and a scenario that involves the consumption of contaminated vegetation (18.7 mg a.e./kg) produces an HQ value of 0.1 (18.7/175). Both of these HQ values are below the LOC which indicates that the herbicide formulation poses no significant risk to large mammals via exposure to contaminated water or vegetation.

Imazapyr: The imazapry NOAEL for mammals is 250 mg a.e./kg (canid data used). An exposure scenario that involves the ingestion of contaminated water (0.000712 mg a.e./kg) yields a HQ value of 0.000003 (0.000712 mg a.e /250), and a scenario that involves the consumption of contaminated vegetation (18.7 mg a.e./kg) yields an HQ value of 0.07 (18.7/250). These calculated HQ values are below the LOC which indicates that the herbicide formulation poses no significant risk to small mammals via exposure to contaminated water, contaminated insect prey or contaminated vegetation.

Triclopyr: The triclopyr amine NOAEL for medium-sized mammals is 100 mg a.e./kg. An exposure scenario that involves the ingestion of contaminated water (0.000325 mg a.e./kg) yields an HQ value of 0.000003 (0.000325/100), and a scenario that involves the consumption of contaminated vegetation (32.9 mg a.e./kg) produces an HQ value of 0.3 (32.9/100). Both of these HQ values are below the LOC which indicates that the herbicide poses no significant risk to large mammals via exposure to contaminated water or contaminated vegetation.

CARNIVOROUS MAMMALS:

Glyphosate: Using the glyphosate NOAEL value of 175 mg a.e./kg and an estimated exposure value of 2.1 mg a.e./kg produces an HQ value of 0.01 (2.1/175). This value is below the LOC and therefore indicates that the herbicide formulation poses no significant toxicological risk to carnivorous mammals that consume small mammal prey that have received direct applications of the herbicide.

Imazapyr: Using the imazapyr NOAEL value of 250 mg a.e./kg (canid data used) and an estimated exposure value of 2.1 mg a.e./kg produces an HQ value of 0.008 (2.1/250). This value is below the LOC and therefore indicates that the herbicide formulation poses no significant toxicological risk to carnivorous mammals that consume small mammal prey that have received direct applications of the herbicide.

Triclopyr: Using the triclopyr amine NOAEL for a 5-kg mammalian predator (20 mg a.e./kg) and an estimated exposure value of 2.72 mg a.e./kg/day produces an HQ value of 0.1 (2.72/20). This value is below the LOC and therefore indicates that the herbicide poses no significant toxicological risk to carnivorous mammals that consume small mammal prey that have received direct applications of the herbicide.

Pacific Fisher (Marten pennanti (pacifica) DPS): The Pacific Fisher is listed as a California species of special concern. Pacific fisher is a specialized forest carnivore that is associated with closed-canopy, late-succession forests throughout its range. Fishers have been documented in the valley floor area of Anderson Creek (Bratcher, pers. Comm. 2011) and in the foothills above Redding. Once target non-native invasive plants are removed, it is anticipated that native riparian plant species will grow and replace the nonnative vegetation, thereby improving habitat conditions for foraging and resting. Indirect effects related to short term loss of some cover is expected to be minimal and widely distributed over the landscape. Program implementation time frame (field work August 15 to Nov 15, or as dictated by CDFW under the Programs Streambed Alteration Permit), avoids the breeding season, by August juvenile are dependent on mothers, but are mobile, travel with mothers, and able to kill prey. Any Pacific fisher observed by crews will trigger MM Bio-3.

Impact Bio-3: Impacts to Pacific fisher would be significant.
With incorporation of Mitigation Measure BIO-3 this impact will be reduced below a level of significance.

Bio-3: To reduce wildlife disturbance, the WSRCD Program Manager shall direct crews to avoid spraying in the presence of wildlife observed in the treatment areas. Areas that are not sprayed due to the presence of wildlife may be sprayed once wildlife have left the treatment area. Areas with suspected occupied nesting or denning habitats shall also be avoided and not treated using manual plant removal methods or herbicides until wildlife have left the area. The WSRCD Program Manager shall demonstrate compliance with this measure through the submission of annual reports due to the California Department of Fish and Game's Northern Region Lake and Streambed Alteration Agreement Program no later than May31of each year that the Program is implemented.

Sierra Nevada Red Fox (Vulpes vulpes necator)/ Sacramento Valley Red Fox: Sierra Nevada red fox is listed as Threatened under CESA. The CNDDB reports a partial skin and skeleton collection of Sierra Nevada red fox by C.H. Townsend on an unknown date near Red Bluff. The current range and distribution of red fox in northern California is centered in the vicinity of Lassen Peak, with periodic sightings by inexperienced observers throughout its historic range, including recent sightings in Mono County. In the Lassen Peak area, red fox distribution changes seasonally with movement in the winter at lower elevations down to 4,700 feet. In the summer, the foxes used higher elevations usually over 6,000 feet. However, it was recently determined that the Sacramento Valley red fox (*Vulpes vulpes ssp. nov.*; Sacks et al. 2010), previously considered an introduced species, is indigenous to California and phylogenetically most closely related to the state-threatened Sierra Nevada red fox. The Current range of the native Sacramento Valley red fox spans the Central Valley from Cottonwood to the Delta, west of the Sacramento River, and Chico to Sacramento, east of the Sacramento River. Hybridization with introduced red foxes was observed, primarily on the southern and southeastern margins of the range, possibly facilitated by low densities of native foxes in these areas. It is presumed here that the Red Bluff occurrence is likely Sacramento Valley red fox rather than Sierra Nevada red fox. As a newly discovered species, Sacramento Valley red fox may meet the CEQA criteria as a rare species (CEQA Guidelines 15380). Once target non-native invasive plants are removed, it is anticipated that native riparian plant species will grow and replace the nonnative vegetation, thereby improving habitat conditions for foraging and resting. Indirect effects related to short term loss of some cover is expected to be minimal and widely distributed over the landscape. Program implementation time frame (field work August 15 to Nov 15, or as dictated by CDFW under the Programs Streambed Alteration Permit), avoids the breeding season. Any red fox observed by crews will trigger MM Bio-3.

Impact Bio-3: Impacts to red fox would be significant.
With incorporation of Mitigation Measure BIO-3 this impact will be reduced below a level of significance.

Bio-3: To reduce wildlife disturbance, the WSRCD Program Manager shall direct crews to avoid spraying in the presence of wildlife observed in the treatment areas. Areas that are not sprayed due to the presence of wildlife may

be sprayed once wildlife have left the treatment area. Areas with suspected occupied nesting or denning habitats shall also be avoided and not treated using manual plant removal methods or herbicides until wildlife have left the area. The WSRCD Program Manager shall demonstrate compliance with this measure through the submission of annual reports due to the California Department of Fish and Game's Northern Region Lake and Streambed Alteration Agreement Program no later than May31of each year that the Program is implemented.

Special-Status Bats: The following bat species have special status and are known/suspected to occur within the Program Area:

Western Red Bat (*Lasiurus blossevillii*)
Townsend's Big-Eared Bat (*Corynorhinus townsendii*)
Pallid Bat (*Antrozous pallidus*)
Silver haired bat (*Lasionycteris noctivagans*)
Hoary Bat (*Lasiurus cinereus*)
Yuma Myotis *(Myotis yumanensis)*

Program work will result in the elimination of nonnative species that block and degrade access (impede hunting) to sections of stream channel immediately adjacent to and within the stream flow of creeks and rivers in the Program area. Not only do these plants impede access to surface water, they also consume large amounts of water that would otherwise be available to bats and those plants that make up bat habitat. Consequently it is anticipated that the Program will improve habitat conditions for bats. The removal and control of these plants will also allow the development of riparian canopy species such as willows and cottonwoods which are utilize for night roosts. In addition, treatments will not occur adjacent to any abandoned structures or under bridges, which sometimes contain both bat and swallow nests. No caves or other geologic structures suitable for this species will be impacted by Program work.

The calculated HQ values are below the LOC which indicates that the herbicide formulation poses no significant risk to small mammals via exposure to contaminated water, contaminated insect prey or contaminated vegetation.

Impact: Impacts to special status bats are below a level of significance.

Sensitive Habitats: The Program will not have an adverse effect on any wetlands, riparian areas or riverine habitats. Although overspray from the foliar application of herbicide could be considered potentially significant in that it could harm or kill native plant species, all chemicals will be applied through focused sprayings in order to minimize potential impacts to native riparian vegetation or wetlands. To prevent herbicide related mortality on riparian vegetation such as willows, cottonwoods and elderberry immediately adjacent to chemically treated target non-native invasive species, branches of riparian vegetation will be trimmed or taped off prior to herbicide applications in order to avoid the effects of overspray. No heavy equipment will be used to remove target non-native invasive plants and little ground disturbance will occur.

Impact: Impacts to riparian habitats, sensitive natural communities, wetlands, are below a level of significance.

Wildlife Movement: The Program will result in short term disturbances in small areas, and will not affect wildlife movement.

Impact: No impact to wildlife movement is anticipated.

Conservation Planning and Zoning: This Program does not conflict with either the Shasta County or Tehama County Oak Woodland Habitat Plans and there are no adopted HCP's, NCCP's or other approved local, regional, or state habitat conservation plans for the Program Area.

Impact: No Impacts to local policies or ordinances, or an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan are anticipated.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
V. Cultural Resources. Will the Program:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☐	☒	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

Discussion: The majority of the Program Area is within currently active stream channels which have periodically disturbed by flood flows. Many of the banks in the area have been extensively eroded and as a result it is unlikely that cultural, archeological or paleontological resources remain other than those that have been eroded from stream banks and transported downstream. In a limited number of areas, Program work will be conducted on stable stream banks where undisturbed cultural resources could be located. Program work will entail hand spraying, hand cutting (loppers, pruners, and chain saws) and no vegetation will be removed using ground disturbing mechanized equipment (excavators, bulldozers, tractors with mowing attachments). Target plants with stems of one inch or less may be dug with a hand spade or levered out of the ground with a weed wrench. As a result, there will be very small areas of soil disturbance that could reveal or disturb subsurface cultural resources. If any such cultural materials are observed or unearthed during target non-native invasive treatments, minor soil disturbing activities will be suspended in the immediate vicinity and herbicides will be utilized instead. Any observations of cultural resources shall be reported to CDFW. Avoiding disturbance to cultural resources is the anticipated action. Local tribes will be notified and WSRCD will work with tribal affiliates to assure cultural resource impacts are avoided.

Impact: Impacts to Cultural Resources are below a level of significance.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. Geology and Soils. Would the Program:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? (Refer to California Geological Survey Special Publication 42.)	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒

iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that will become unstable as a result of the Program, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

Discussion: All Program work will be completed within the riparian zone of the Program area. As proposed, the Program will not result in hazardous conditions or exacerbate current conditions related to earthquake or ground rupture. In addition, any soil erosion attributable to initial unstable bank conditions created after target non-native invasive plants have been removed will be minor and short term in nature. It is anticipated that deeply rooted native riparian plants will rapidly reestablish themselves within the Program Area greatly reducing rates of sediment production and stream bank erosion.

Impact: Impacts related to Geology and Soils are below a level of significance.

ENVIRONMENTAL ISSUES	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
VII. Greenhouse Gas Emissions. Would the Program:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Discussion: The Proposed Program would generate greenhouse gas (GHG) emissions through from: 1) the exhaust of vehicles used to transport crews, equipment, and materials, 2) powered hand tools (chainsaws) and sprayers, and 3) chippers used to mulch biomass. Cut biomass of target non-native invasive species may also generate GHG emissions, through decomposition, for example. The period of target non-native invasive treatment would be short-term and minor in nature. Furthermore, native riparian species expected to re-colonize the treatment sites will provide carbon sequestration services, require less management in the future, and be less susceptible to fire than *Arundo*.

Impact: Impacts related to Greenhouse Gas Emissions are below a level of significance.

ENVIRONMENTAL ISSUES	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
VIII. Hazards and Hazardous Materials. Would the Program:				

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, will it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a Program located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, Would the Program result in a safety hazard for people residing or working in the Program Area?	☐	☐	☐	☒
f) For a Program within the vicinity of a private airstrip, Would the Program result in a safety hazard for people residing or working in the Program Area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐

Discussion: The glyphosate, imazapyr, and triclopyr herbicides selected for this Program pose insignificant risks to non-target wildlife and their habitats and to persons who may be in the Program area during, and after, the application period. This is due primarily to application methods being used (low-volume, ground-based applications with hand-held equipment), the use of certified Applicators, and the relatively small amounts of chemicals that will be used. The potential for off-target movement of the herbicide and surfactant products during and after the Program period is very low for glyphosate and triclopyr. Imazapyr has a greater risk of mobility, so the program will closely monitor the rate (volume of material per acre) to assure that over application does not occur.

This Program would not require long-term storage, use, disposal or transport of hazardous material in significant amounts. Only adequately trained and certified Applicators are used in conducting herbicide treatments. Daily herbicide treatment operations will be supervised by a California Department of Pesticide Regulation (DPR) certified Applicator. Vegetation treatments will be conducted by hand including cutting and daubing of plant stems and herbicide spraying on cut and standing vegetation. In order to minimize potential impacts to non-target vegetation, herbicides applications will involve applications made directly to weed targets. In some cases, native species such as willow, cottonwood and elderberry may be trimmed to reduce the potential for herbicide overspray.

The only fueled equipment to be used in riparian areas within the Program work will be quads (which will transport personnel, chemicals and equipment to treatment areas) and power hand tools. Chippers and tractors or trucks used to move the chipper will only operate on pre-existing roads and access areas. Chippers and tractors will not enter or cross standing or flowing water. There is the possibility for gasoline to be spilled during refueling operations or during transport. This is unlikely and the risk of a spill would be low. The amount of fuel being transported would be approximately 20 gallons per day. Though unlikely, a fuel spill is potentially significant.

No mixing of chemicals will occur within one-quarter mile of a school. There are no sites which are included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 in the program area. The Program Area does not lie within an airport land use plan but is within two miles of several small airports and the Redding Municipal Airport. However, no project activities would impact airport operations and riparian areas are over 1,000

from any airport. This Program would not interfere with an adopted emergency response plan or emergency evacuation plan.

It is anticipated that through the control of scattered stands of target non-native invasive plants, particularly *Arundo*, within the watershed's riparian zone, native riparian forest, shrub, grass species and bare ground will replace flammable non-native vegetation reducing the threat of high intensity wildfire. Though unlikely, it is possible that the Program could result in ignition of an accidental fire. This impact is potentially significant.

Impact Haz-1: Impacts associated with fuel spills in riparian areas are potentially significant.
With incorporation of Mitigation Measure HAZ-1 this impact will be reduced below a level of significance.

Haz-1: To reduce potential impacts associated with fuel spills in riparian areas, the Program Manager shall ensure that gasoline at no time is transported across a flowing stream. Only existing roads shall be used to move personnel, equipment and materials into and out of the Program site. The amount of time vehicles (quads) transporting other chemicals pass through flowing or standing water shall be minimized. The Program Manager shall select fuel storage, refueling and maintenance areas for equipment on flat disturbed upland sites that are away from dry or wet waterways and areas that could potentially flow into a stream in the event of an accidental spill. Spill/fuel containment materials and equipment shall be made available and used at refueling and maintenance areas. Equipment shall be stored and maintained within properly cleared areas. The Applicator shall be responsible for immediate containment and removal of any spilled material. The clean-up of all petroleum and/or chemical spills shall begin immediately and the appropriate authorities and CDFW shall be notified immediately if a spill occurs. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur. The Program Manager or certified Applicator shall make daily inspections for leaks, correcting and repairing any such leaks prior to resuming their use. The daily inspections shall be incorporated into the Program files along with evidence of any repairs required and completed before returning equipment to Program work sites. The WSRCD Program Manager shall demonstrate compliance with this measure through the submission of annual reports due to the California Department of Fish and Game's Northern Region Lake and Streambed Alteration Agreement Program no later than May 31of each year that the Program is implemented.

Impact Haz-2: Impacts associated with exposure of people or structures to wildland fires are potentially significant.
With incorporation of Mitigation Measure HAZ-2 this impact will be reduced below a level of significance.

Haz-2: To reduce impacts associated with exposure of people or structures to wildland fires, the WSRCD Program Manager shall ensure that adequate fire protection equipment is available at work sites. This shall include fire extinguishers attached to all mechanized equipment. In addition, firefighting hand tools shall be made available at all areas where mechanical equipment is operated. The WSRCD Program Manager, Applicators, and all workers shall comply with all applicable fire safe standards as found in Public Resources Code Division 4, Chapter 6, (PRC's 4427, 4428, 4429, 4431, 4442, list not all inclusive). Vehicles shall not be parked in tall grass or any other location where heat from the exhaust system could ignite a fire. All motorized equipment shall have approved spark arrestors. A dependable radio or phone communication shall be available on site to report any emergency which may occur. All cut non-native vegetation shall be removed from the stream area. Treated invasive species that have the potential to cause a significant fire risk to surrounding vegetation and structures or the potential to cause an obstruction to any structure shall have canes, limbs or other vegetative material removed and chipped or disposed of in a legal manner. The WSRCD Program Manager shall demonstrate compliance with this measure through the submission of annual reports due to the California Department of Fish and Game's Northern Region Lake and Streambed Alteration Agreement Program no later than May 31of each year that the Program is implemented.

No significant adverse impacts to Hazards or Hazardous Materials are anticipated with the implementation of the above Mitigation Measure.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. Hydrology and Water Quality. Would the Program:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there will be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells will drop to a level that will not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which will result in substantial on- or off-site erosion or siltation?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in on- or off-site flooding?	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒
f) Otherwise substantially degrade water quality?	☐	☐	☐	☒
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Result in inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

Discussion: With the removal of *Arundo*, saltcedar and other invasive plants from active portions of stream channels, existing drainage patterns within the Program will be positively affected. Islands of vegetation that currently block and redirect floodwaters to adjacent banks will be controlled resulting in more natural flows and stream course conditions. As a result of these improved flow conditions, the threat of bank erosion, siltation of stream flows and flooding will be reduced. Any soil erosion attributable to initial unstable bank conditions created after target non-native invasive plants have been removed will be minor and short term in nature. It is anticipated that deeply rooted native riparian plants will rapidly reestablish themselves within the Program Area reducing rates of sediment production and stream bank erosion.

Impact: Impacts related to Hydrology and Water Quality are below a level of significance.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
X. Land Use and Planning. Would the Program:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Program (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

Discussion: The Program work is control of small scattered infestations of target non-native plants in a portion of Shasta and Tehama Counties where the major land uses consist of residential parcels, farming, ranching, commercial as well as open space and wildlife production. The work will not divide a community or conflict with land use plans or policies. Work activities will reduce fire and flood risks, conserve water, and benefit flora and fauna, so there is no conflict with exiting or planed conservation plans.

Impact: No adverse impacts to Land Use and Planning are anticipated.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. Mineral Resources. Would the Program:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒

Discussion: Program work does not entail the extraction of mineral resources or the execution of subsurface materials. The Program activities will not result in the loss of mineral resources or the availability of a locally important mineral resource recovery site.

Impact: No adverse impacts to Mineral Resources are anticipated.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. Noise. Would the Program result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or in other applicable local, state, or federal standards?	☐	☐	☒	☐
b) Exposure of persons to or generation of excessive groundborne	☐	☐	☒	☐

vibration or groundborne noise levels?				
c) A substantial permanent increase in ambient noise levels in the Program vicinity above levels existing without the Program?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the Program vicinity above levels existing without the Program?	☐	☐	☒	☐
e) For a Program located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, will the Program expose people residing or working in the Program Area to excessive noise levels?	☐	☐	☐	☒
f) For a Program within the vicinity of a private airstrip, will the Program expose people residing or working in the Program Area to excessive noise levels?	☐	☐	☐	☒

Discussion: The only equipment to be used within the Program Area will be: vehicles to transport crews to work sites, chainsaws, chippers, and 4 wheel quads used for transportation. Chippers, quads and chainsaws are commonly used on the properties within the Program Area therefore, use of this equipment during Program implementation is considered to be within the range of the ambient noise levels that are created in the area. All equipment will be fitted with appropriate mufflers. Equipment will only be operated during daylight hours and only in a particular area for a short period of time. Once Program work has been completed within a portion of the Program Area, noise levels will return to ambient levels.

Impact: Impacts related to Noise will be below a level of significance

ENVIRONMENTAL ISSUES	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
XIII. Population and Housing. Would the Program:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing homes, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion: The Program Area is within rural and urban portions of Shasta and Tehama Counties which have been zoned for farming, ranching, commercial, residential and large lot/ranchette development. Program work will occur within or immediately adjacent to riparian areas and will not impact development or population growth with the vicinity of the Program Area. No population displacement will occur.

Impact: No impacts to Population and Housing are anticipated.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant significance with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. Public Services. Would the Program:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

Discussion: The Program activities are in undeveloped riparian habitat and no construction is involved. There are no impacts negative impacts to public services or facilities used to provide services. It is anticipated that Program work will positively impact fire protection through the removal of dense highly flammable vegetation and replacing it with native species that are more fire resistant. Flood risk is also reduced, protecting public and private infrastructure.

Impact: **No impacts to Public Services are anticipated.**

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. Recreation. Would the Program:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☐	☒

Discussion: The Program Area is located on public and private lands on floodplains and riparian areas. Project activities will have no impact on use of parks or other recreational facilities. No facilities are being built or modified.

Impact: No impacts to Recreation are anticipated.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. Transportation/Traffic. Would the Program:				

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☒
b) Conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

Discussion: All Program work will occur within floodplains and riparian areas. No impacts to transportation or traffic will occur. The execution of Program work will not increase traffic or delay traffic flows within the Program Area.

Impact: No impacts related to Transportation or Traffic are anticipated.

ENVIRONMENTAL ISSUES	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
XVII. Utilities and Service Systems. Would the Program:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the Program from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider that serves or may serve the Program that it has adequate capacity to serve the Program's Programed demand, in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to	☐	☐	☒	☐

accommodate the Program's solid waste disposal needs?				
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☒	☐

Discussion: The Program will not create a wastewater discharge, require or result in the construction of new water or wastewater treatment facilities, or require or result in the construction of new storm water drainage facilities. All target non-native invasive biomass will be left on site, some chipped and some left standing. If there is not sufficient appropriate space on the project site (a rare occurrence in *Arundo* programs), chipped material may be transported to landfills it may be recycled or used as daily cover, accordingly it will not impact land fill space. Cut vegetative material will be removed from the stream channel and chipped and spread on site (in consultation with landowners) using County approved methods. Although the volume of material that could be chipped is not known with certainty at this time, it is not expected to create a solid waste disposal issue.

Impact: Impacts to Public Utility and Service Systems are below a level of significance.

ENVIRONMENTAL ISSUES	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
XVIII. Mandatory Findings of Significance.				
a) Does the Program have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the Program have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a Program are considerable when viewed in connection with the effects of past Programs, the effects of other current Programs, and the effects of probable future Programs.)	☐	☐	☒	☐
c) Does the Program have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

Discussion:

a) Would the Program have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory?

Several special status species have the potential to occur in the Program area. Through the removal of invasive plant vegetation and the appropriate use of registered aquatic approved herbicides, impacts to some of these listed species could occur. Mitigation Measures were developed in order to reduce potentially significant impacts to special status species. As a result, the implementation of these Mitigation Measures Bio-1, Bio-2, and Bio-3 will reduce the impacts of Program work on native species found within the Program Area to a below a level of significance level.

b) Would the Program have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a Project are considerable when viewed in connection with the effects of past Projects, the effects of other current Projects, and the effects of probable future Project.)

There are no known federal, state or private Programs within the vicinity of this Program other than normal land management operations on private land, along with County road maintenance. Between 1999 and 2006, glyphosate was reportedly used in all 58 counties in California with the total amount approximately 7.8 million pounds (a.e.) in 2006 (EPA 2009). In addition, glyphosate has a number of residential and industrial uses that are not represented in these data. Landscape maintenance and rights of way are among the highest usages in the counties which may have some currently CARLF occupied areas (EPA 2009). Shasta and Tehama Counties are not considered one of these areas, and other than localized control of weeds by landowners in the area, there are no substantial agricultural practices that would warrant the larger scale of herbicide treatment (using glyphosate, imazapyr or triclopyr) in other parts of California. Within the Program areas, the land use is largely rural and is comprised of small ranchettes (two to ten acres) and larger ranches. Cattle ranching is the predominant agriculture practice. Use of glyphosate, imazapyr and/or triclopyr at these locations is believed to be low. Therefore, from a cumulative effects perspective, the Program is believed to be contributing an insignificant amount of herbicide exposure.

Importantly, the removal and control of unnatural riparian plant species, Program work will improve the overall health, functioning and natural species diversity found within the creek and river system's riparian corridor. In order to prevent negative impacts during the execution of this watershed improvement Program, an array of Mitigation Measures have been developed that will reduce such impacts to a below a level of significance level. In addition, Program work will only occur within a small portion of the Program area and there are no other large scale herbicide related invasive species control Programs currently being completed or planned.

c) Would the Program have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?

The glyphosate, imazapyr and triclopyr herbicides selected for this Program pose insignificant risks to persons who may be in the Program area during, and after, the application period. The potential for off-target movement of the herbicide and surfactant products during and after the Program period is very low. This is due primarily to application methods being used (low-volume, ground-based applications with hand-held equipment) the use of certified applicators and the relatively small amounts of chemicals that will be used.

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This document is based on the South Fork Cottonwood Creek nonnative plant management and control project, CEQA Initial Study and MND that was prepared by CDFW and Tehama RCD (2012). That project work area is part of this MND Program area.

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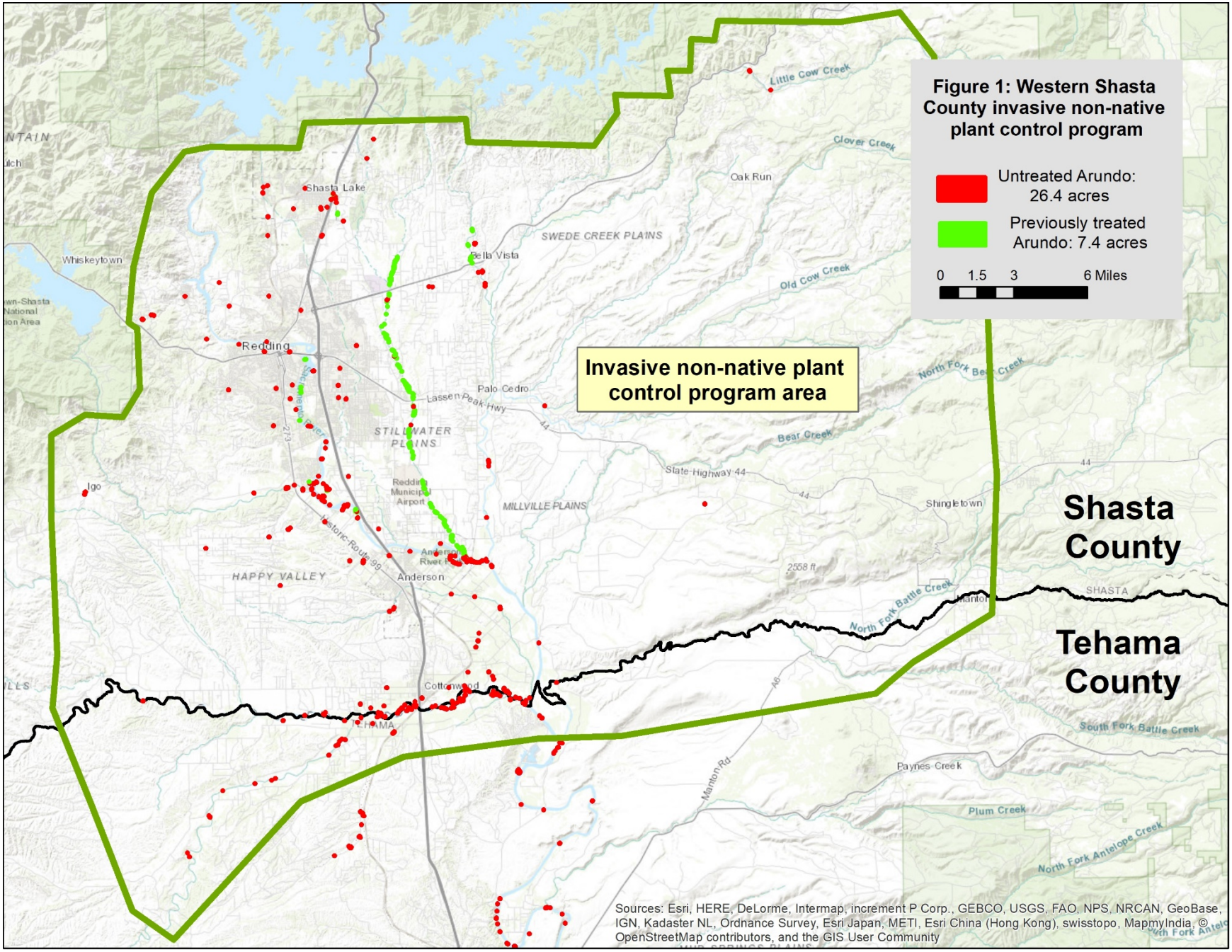


Figure 1: Western Shasta County invasive non-native plant control program
Untreated Arundo: 26.4 acres
Previously treated Arundo: 7.4 acres
0 1.5 3 6 Miles
Invasive non-native plant control program area
Shasta County
Tehama County
Redding
Shasta Lake
Whiskeytown
Bella Vista
Palo Cedro
Anderson
Cottonwood
Shingletown
Oak Run
Igo
Little Cow Creek
Clover Creek
Old Cow Creek
Bear Creek
North Fork Battle Creek
South Fork Battle Creek
Paynes Creek
Plum Creek
North Fork Antelope Creek
Lassen Peak Hwy
State Highway 44
Manton Rd
SWEDE CREEK PLAINS
STILLWATER PLAINS
MILLVILLE PLAINS
HAPPY VALLEY
Redding Municipal Airport
2558 ft
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

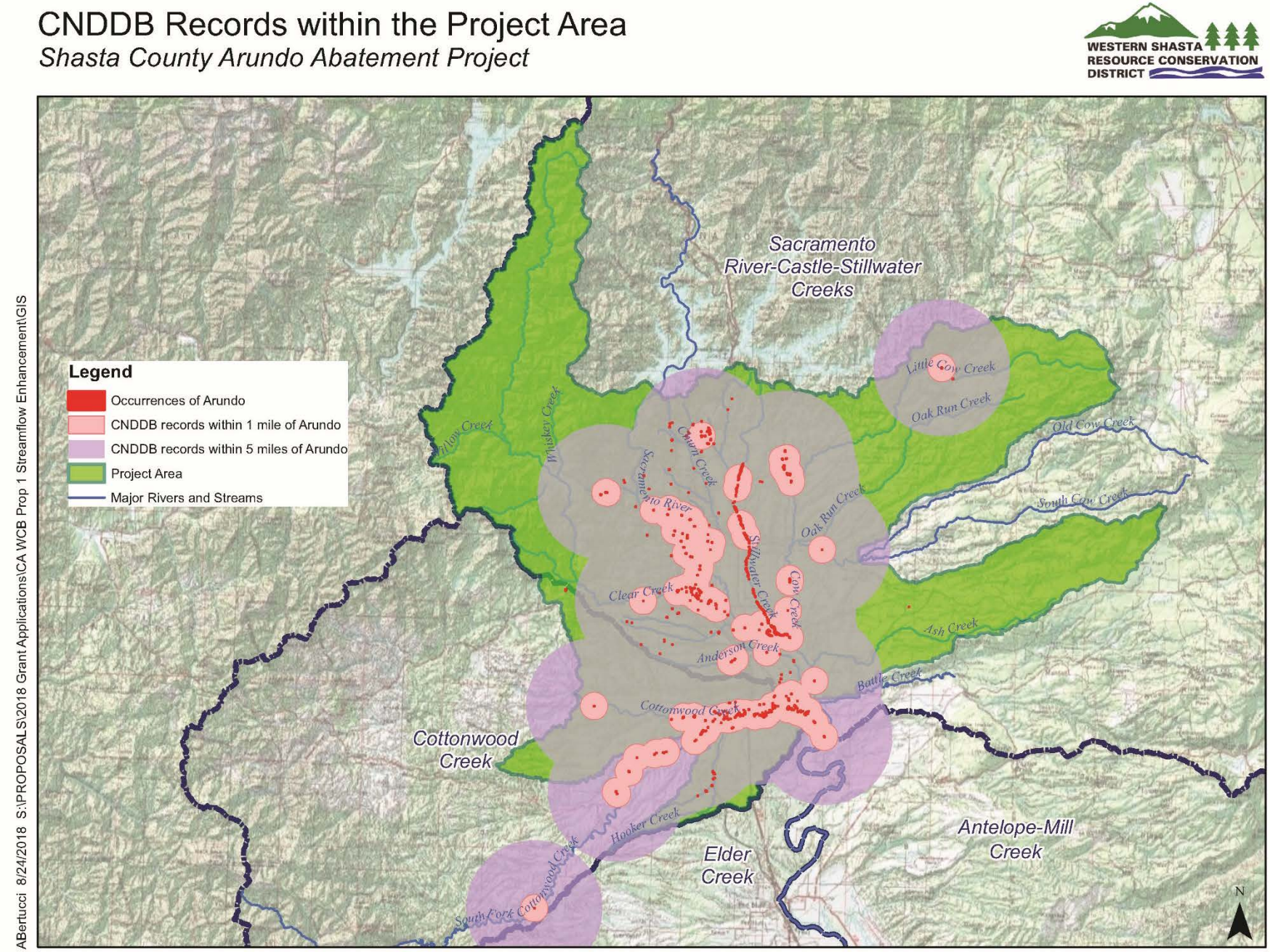


Figure 2. CNDDB data records

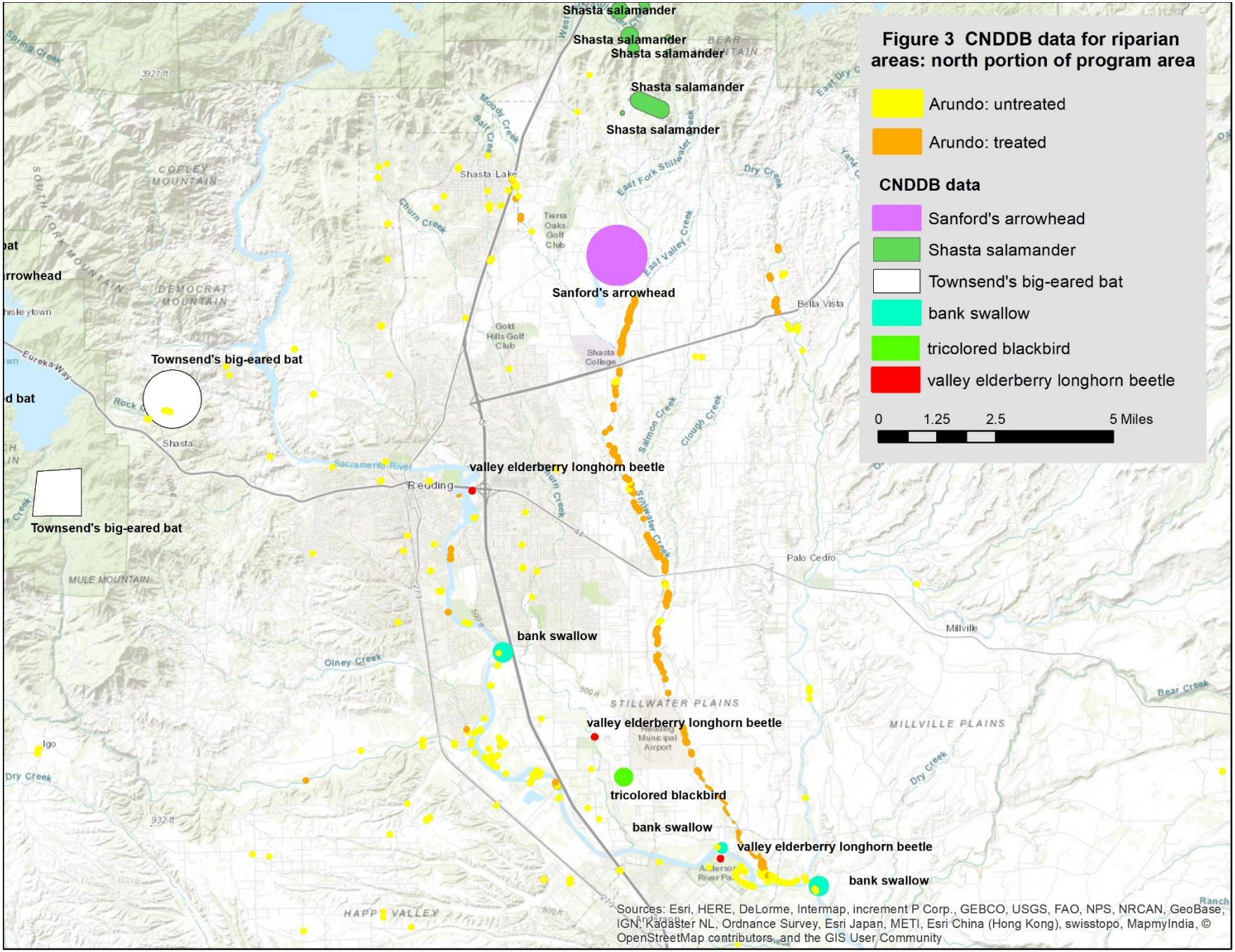
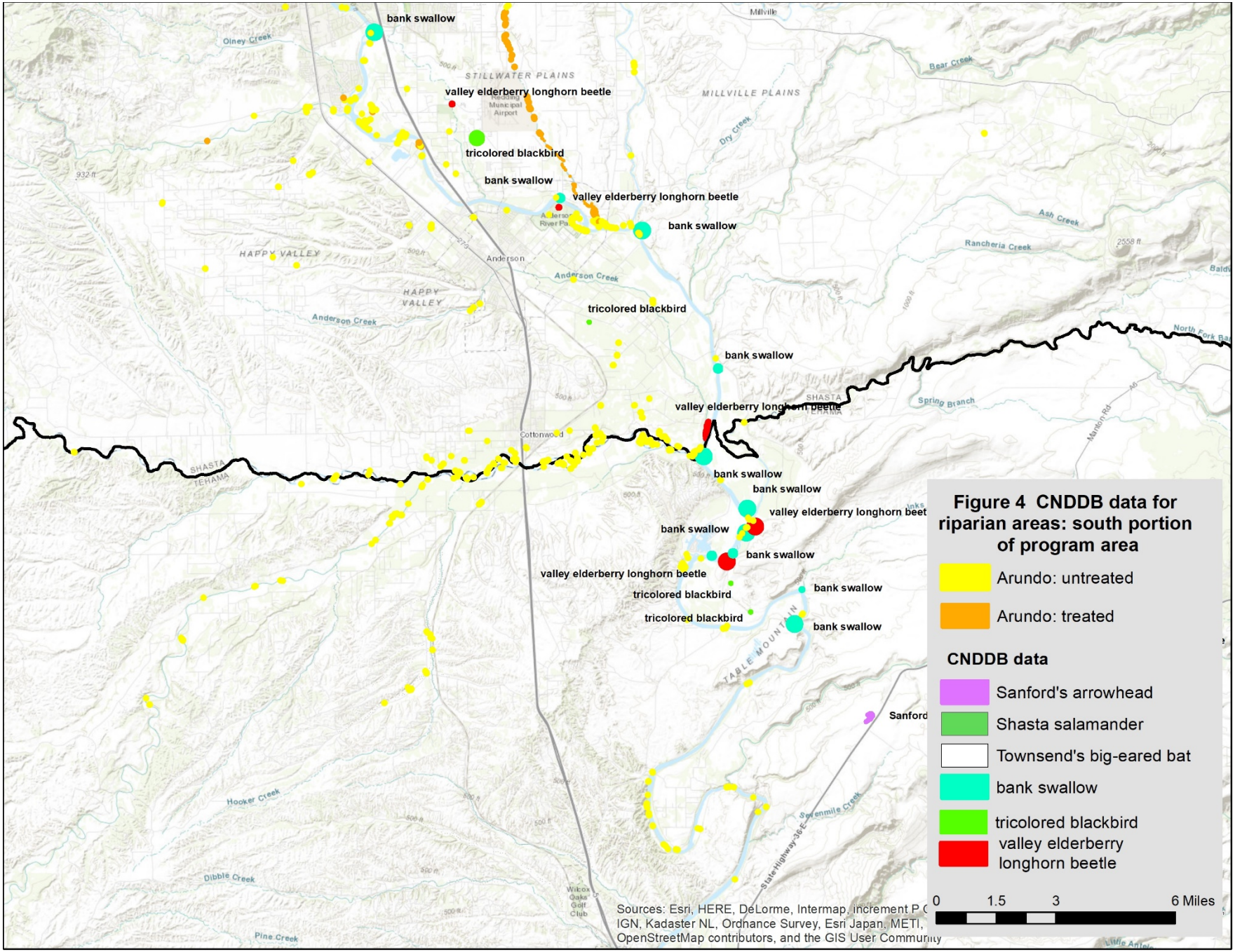
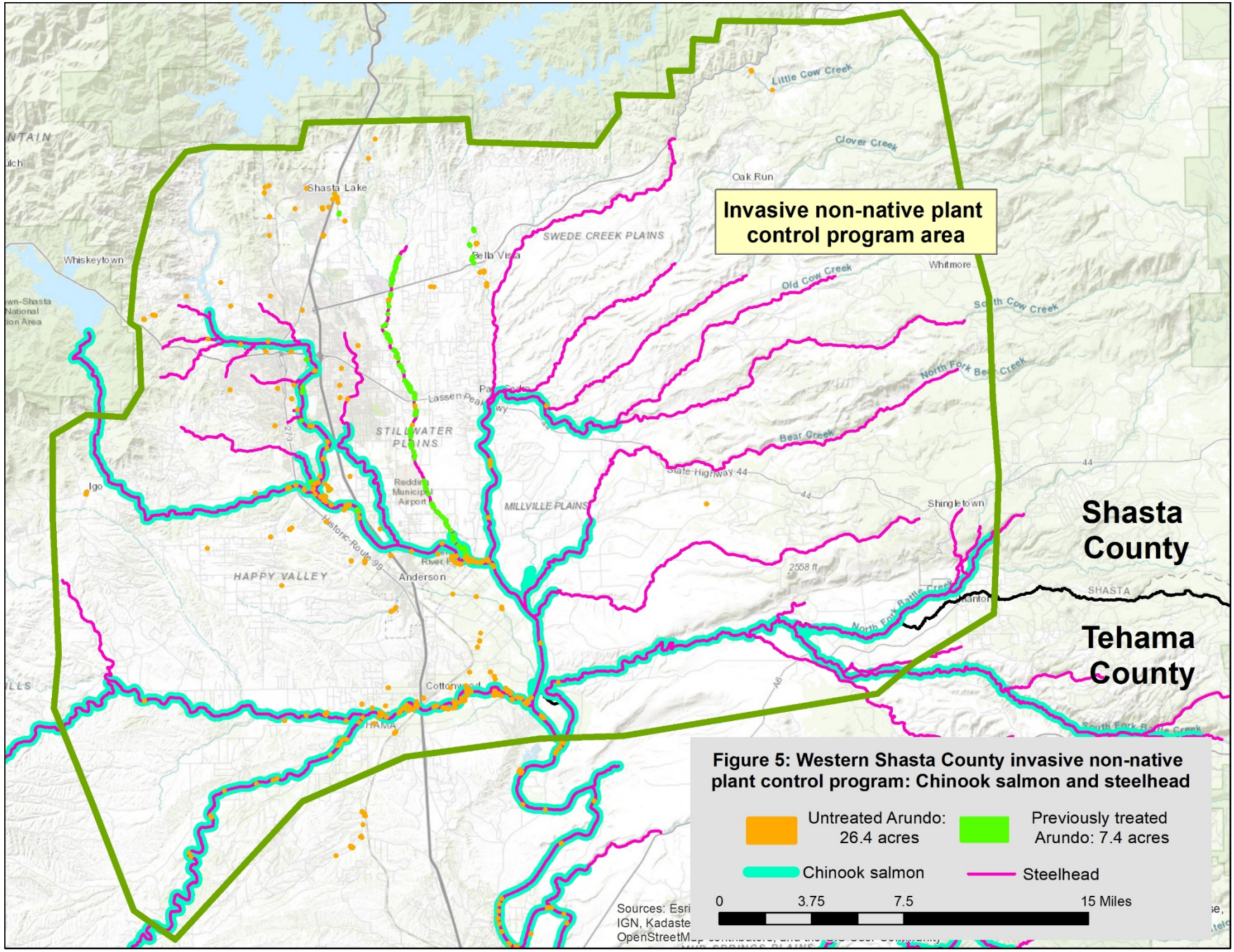
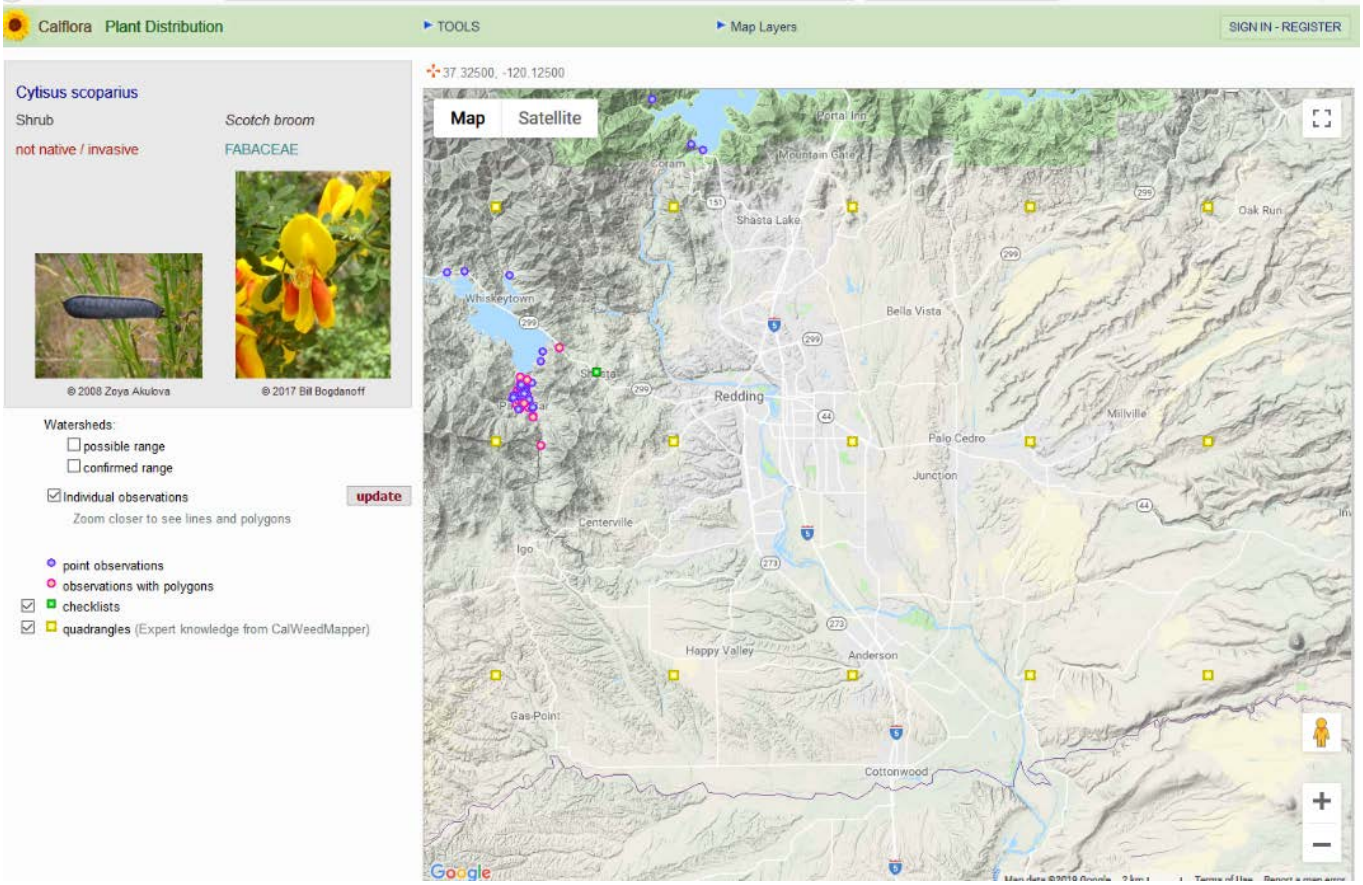


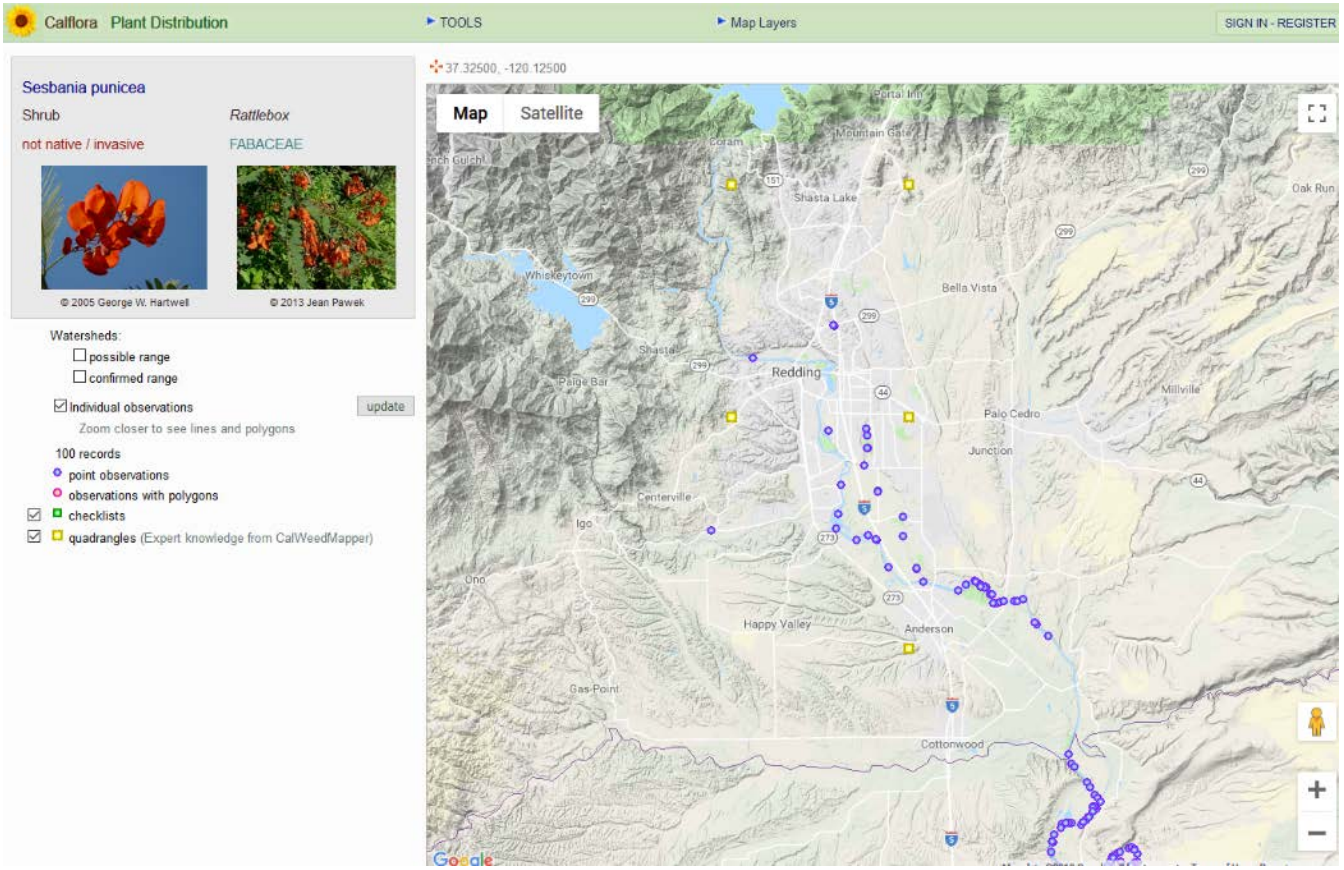
Figure 3 CNDDB data for riparian areas: north portion of program area
Arundo: untreated
Arundo: treated
CNDDB data
Sanford's arrowhead
Shasta salamander
Townsend's big-eared bat
bank swallow
tricolored blackbird
valley elderberry longhorn beetle
0 1.25 2.5 5 Miles
Shasta salamander
Shasta salamander
Shasta salamander
Shasta salamander
Shasta salamander
Sanford's arrowhead
Townsend's big-eared bat
Townsend's big-eared bat
valley elderberry longhorn beetle
bank swallow
valley elderberry longhorn beetle
tricolored blackbird
bank swallow
valley elderberry longhorn beetle
bank swallow
Shasta Lake
Redding
Bella Vista
Palo Cedro
Millville
Shasta
Sacramento River
COPLEY MOUNTAIN
DEMOCRAT MOUNTAIN
MULE MOUNTAIN
STILLWATER PLAINS
MILLVILLE PLAINS
HAPPY VALLEY
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

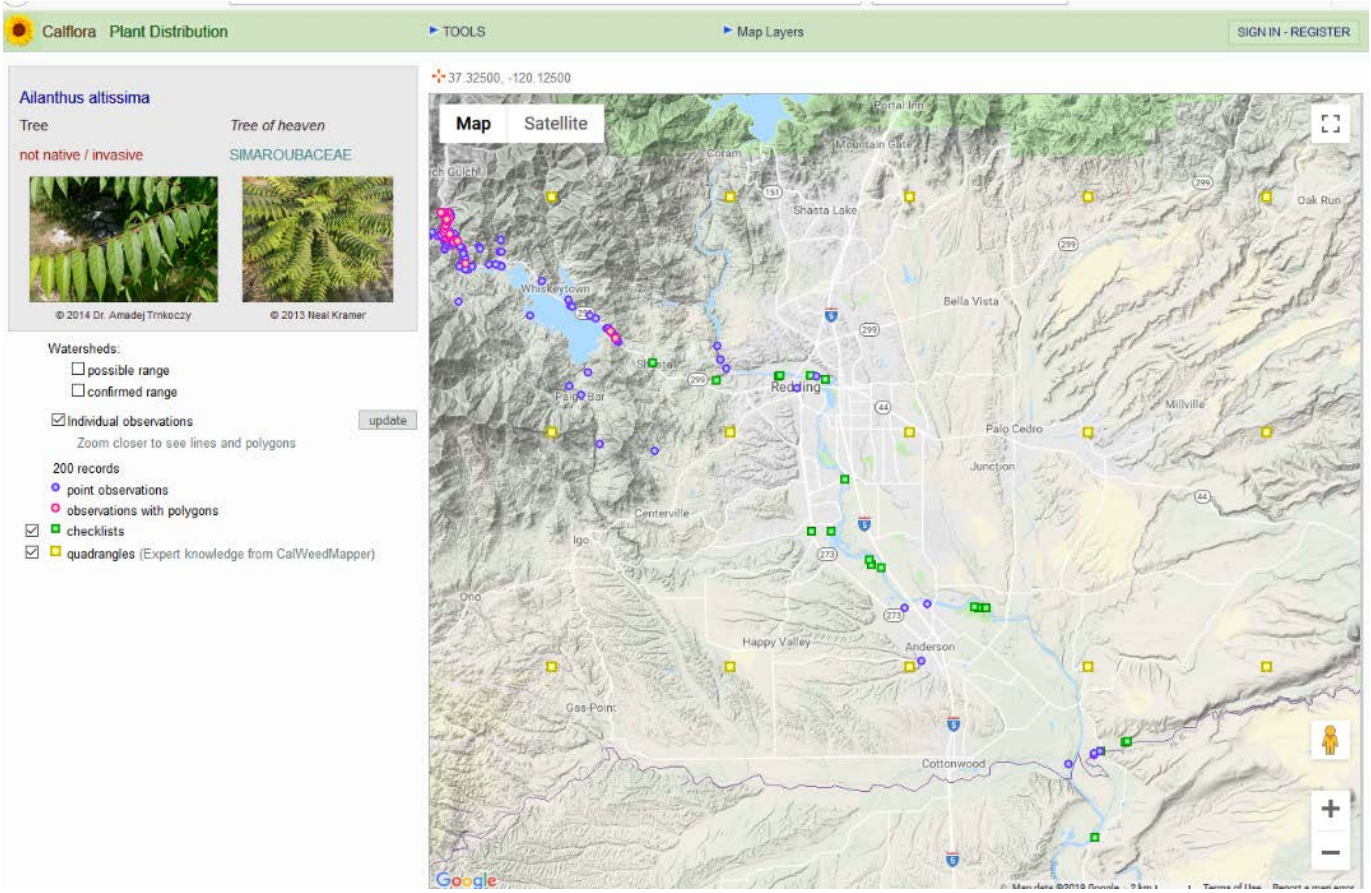

bank swallow
valley elderberry longhorn beetle
tricolored blackbird
bank swallow
valley elderberry longhorn beetle
bank swallow
tricolored blackbird
bank swallow
valley elderberry longhorn beetle
bank swallow
bank swallow
valley elderberry longhorn beet
bank swallow
bank swallow
valley elderberry longhorn beetle
tricolored blackbird
bank swallow
tricolored blackbird
bank swallow
Sanford
Millville
Olney Creek
STILLWATER PLAINS
MILLVILLE PLAINS
Bear Creek
Dry Creek
Redding Municipal Airport
Anderson
Anderson Creek
HAPPY VALLEY
Ash Creek
Rancheria Creek
Cottonwood
SHASTA DAM
Spring Branch
SHASTA
TEHAMA
TABLE MOUNTAIN
Hooker Creek
Dibble Creek
Pine Creek
Sevenmile Creek
State Highway 36 E
Wilcox Oaks Golf Club
Figure 4 CNDDB data for riparian areas: south portion of program area
Arundo: untreated
Arundo: treated
CNDDB data
Sanford's arrowhead
Shasta salamander
Townsend's big-eared bat
bank swallow
tricolored blackbird
valley elderberry longhorn beetle
0
1.5
3
6 Miles
Sources: Esri, HERE, DeLorme, Intermap, increment P C
IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI,
OpenStreetMap contributors, and the GIS User Community

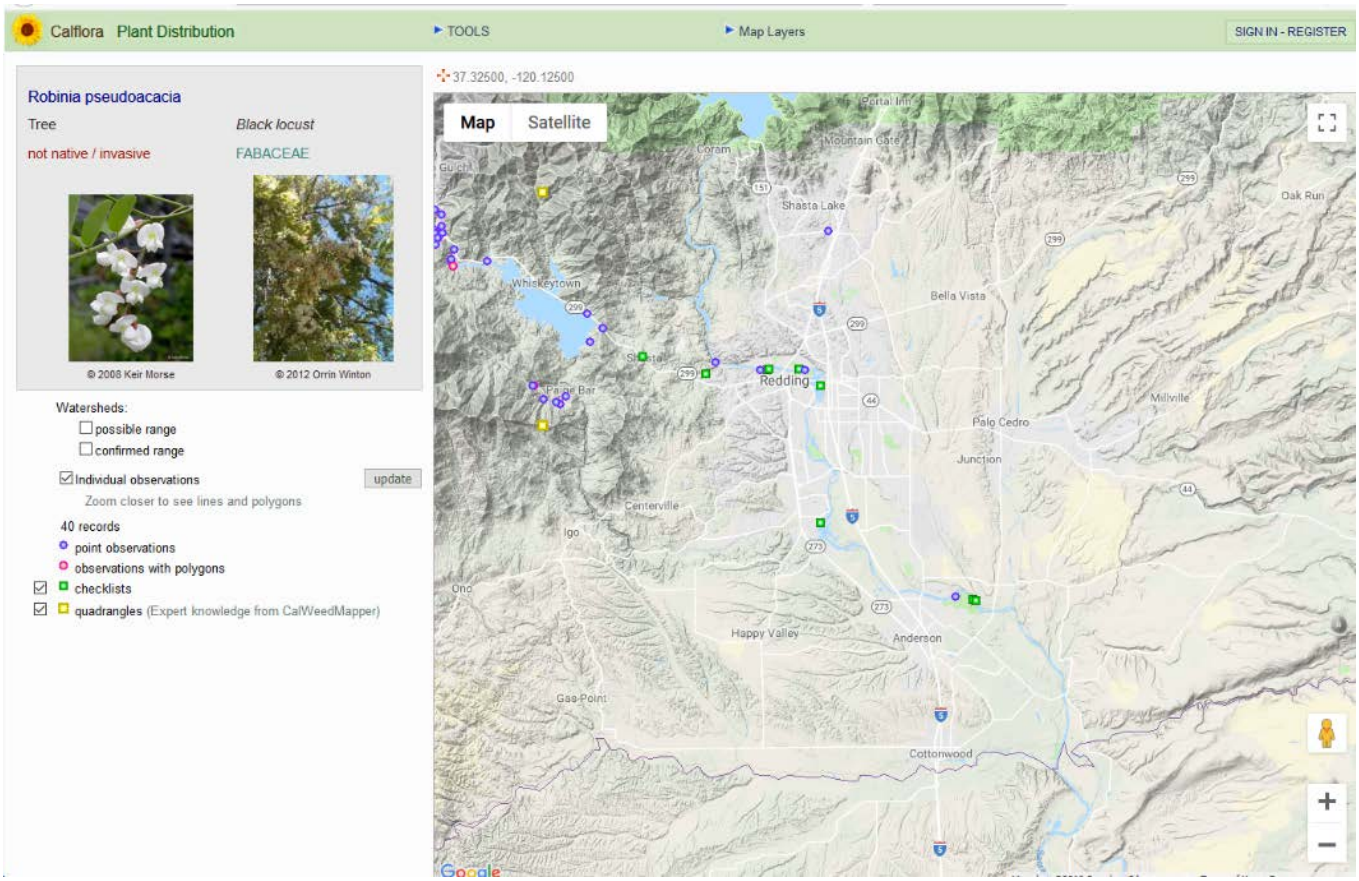

Invasive non-native plant control program area
Shasta County
Tehama County
Figure 5: Western Shasta County invasive non-native plant control program: Chinook salmon and steelhead
Untreated Arundo: 26.4 acres
Previously treated Arundo: 7.4 acres
Chinook salmon
Steelhead
0
3.75
7.5
15 Miles
Sources: Esri
IGN, Kadaste
OpenStreetMap
Shasta Lake
Whiskeytown
Bella Vista
SWEDE CREEK PLAINS
Oak Run
Whitmore
Little Cow Creek
Clover Creek
Old Cow Creek
South Cow Creek
North Fork Bear Creek
Bear Creek
Lassen Peak Hwy
STILLWATER PLAINS
Redding Municipal Airport
MILLVILLE PLAINS
State Highway 44
Shingletown
Igo
Historic Route 99
HAPPY VALLEY
Anderson
2558 ft
SHASTA
Manton
North Fork Battle Creek
South Fork Battle Creek
Cottonwood
TEHAMA

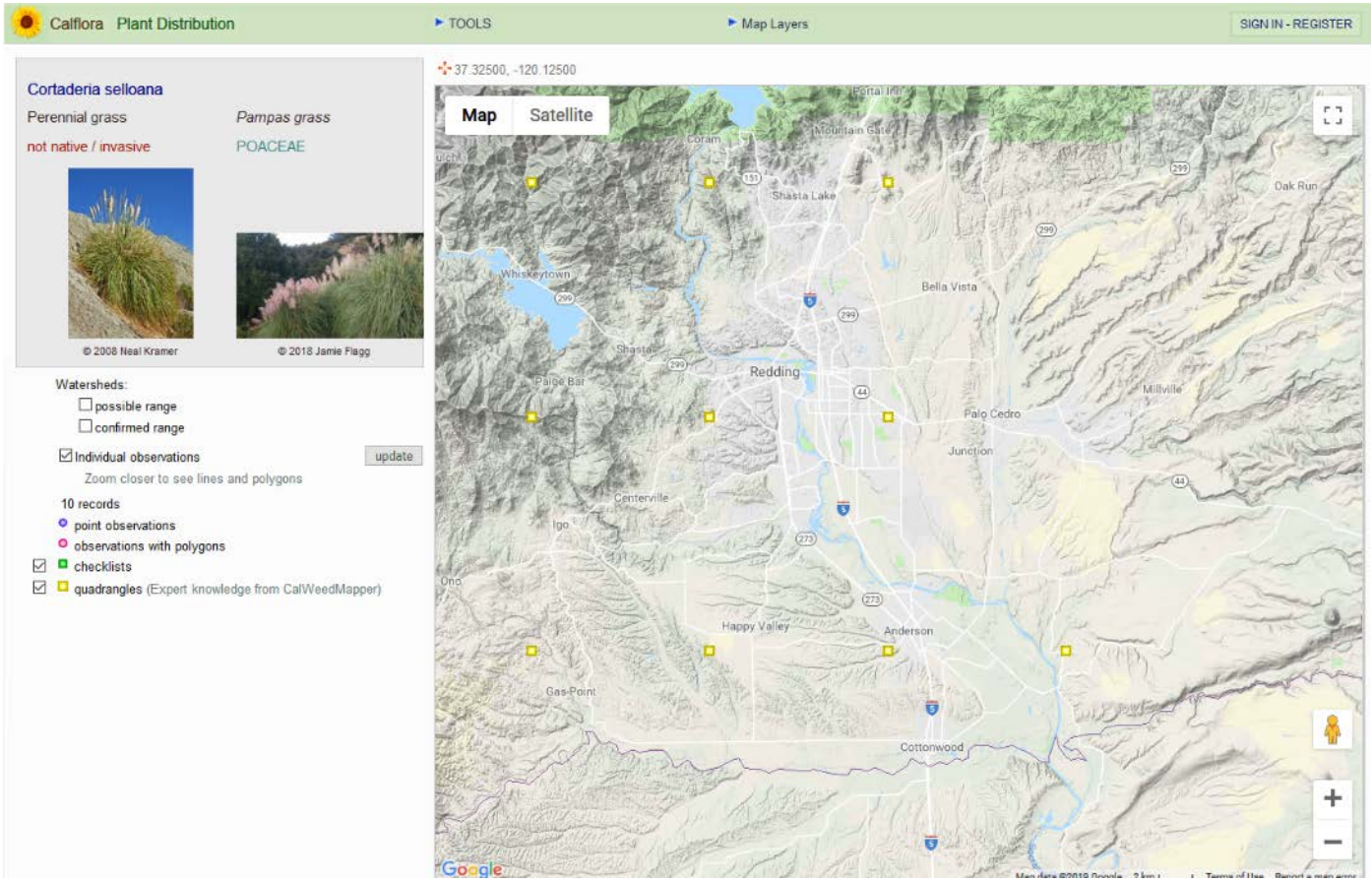
Appendix 1: Calflora (https://www.calflora.org//) distribution data for target invasive non-native plant species.

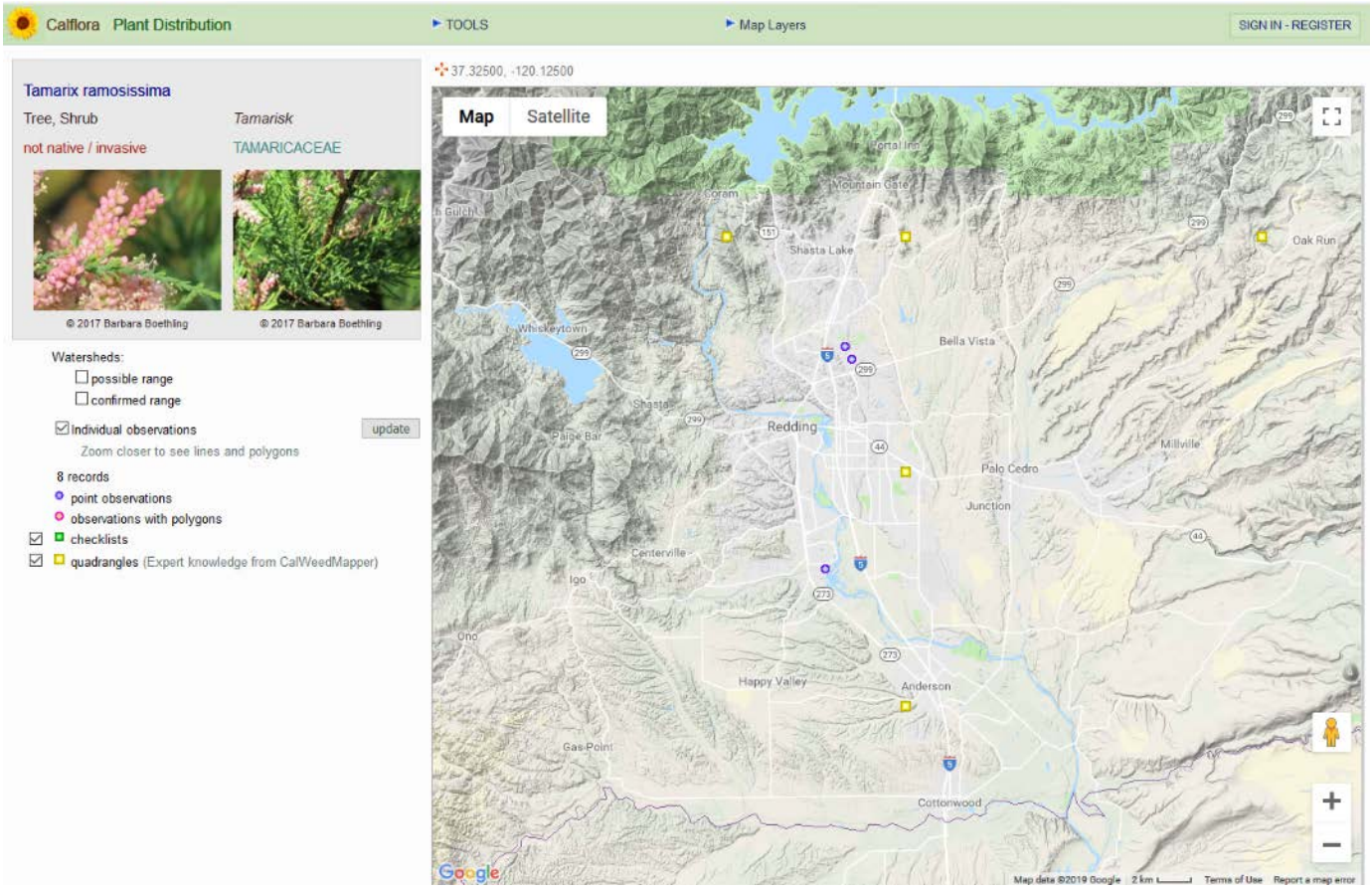





Calflora Plant Distribution
TOOLS
Map Layers
SIGN IN - REGISTER
Ailanthus altissima
Tree
Tree of heaven
not native / invasive
SIMAROUBACEAE
© 2014 Dr. Amadej Trnkoczy
© 2013 Neal Kramer
Watersheds:
possible range
confirmed range
Individual observations
update
Zoom closer to see lines and polygons
200 records
point observations
observations with polygons
checklists
quadrangles (Expert knowledge from CalWeedMapper)
37.32500, -120.12500
Map
Satellite
Redding
Shasta Lake
Whiskeytown
Bella Vista
Palo Cedro
Millville
Junction
Centerville
Igo
Ono
Happy Valley
Anderson
Gas Point
Cottonwood
Oak Run
Coram
Mountain Gate
Google


Calflora Plant Distribution
TOOLS
Map Layers
SIGN IN - REGISTER
Robinia pseudoacacia
Tree
Black locust
not native / invasive
FABACEAE
© 2008 Keir Morse
© 2012 Orrin Winton
Watersheds:
possible range
confirmed range
Individual observations
update
Zoom closer to see lines and polygons
40 records
point observations
observations with polygons
checklists
quadrangles (Expert knowledge from CalWeedMapper)
37.32500, -120.12500
Map
Satellite
Redding
Shasta Lake
Whiskeytown
Bella Vista
Palo Cedro
Millville
Junction
Centerville
Igo
Ono
Happy Valley
Anderson
Gas Point
Cottonwood
Oak Run
Coram
Mountain Gate
Google


Calflora Plant Distribution
TOOLS
Map Layers
SIGN IN - REGISTER
Cortaderia selloana
Perennial grass
Pampas grass
not native / invasive
POACEAE
© 2008 Neal Kramer
© 2018 Jamie Flagg
Watersheds:
possible range
confirmed range
Individual observations
update
Zoom closer to see lines and polygons
10 records
point observations
observations with polygons
checklists
quadrangles (Expert knowledge from CalWeedMapper)
37.32500, -120.12500
Map
Satellite
Redding
Shasta Lake
Oak Run
Bella Vista
Whiskeytown
Shasta
Palo Cedro
Millville
Junction
Centerville
Igo
Ono
Happy Valley
Anderson
Gas Point
Cottonwood
Google


Calflora Plant Distribution
TOOLS
Map Layers
SIGN IN - REGISTER
Tamarix ramosissima
Tree, Shrub
Tamarisk
not native / invasive
TAMARICACEAE
© 2017 Barbara Boehling
© 2017 Barbara Boehling
Watersheds:
possible range
confirmed range
Individual observations
update
Zoom closer to see lines and polygons
8 records
point observations
observations with polygons
checklists
quadrangles (Expert knowledge from CalWeedMapper)
37.32500, -120.12500
Map
Satellite
Redding
Shasta Lake
Oak Run
Bella Vista
Whiskeytown
Shasta
Palo Cedro
Millville
Junction
Centerville
Igo
Ono
Happy Valley
Anderson
Gas Point
Cottonwood
Google
Map data ©2019 Google
2 km
Terms of Use
Report a map error