

**Post-fire Riparian Forest Restoration
and Arundo and Tamarisk Eradication Project, Solano
County, California**
Draft Initial Study and Mitigated Negative Declaration

**Prepared For:
Solano County Resource
Conservation District**

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Acronyms Used

Acronym	Meaning
BMP	Best Management Practice
Cal-IPC	California Invasive Plant Council
CalRecycle	CA Department of Resources Recycling and Recovery
CARLF	California Red-Legged Frog
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CVS	Central Valley spring-run
DPR	Department of Pesticide Regulation
DWR	Department of Water Resources
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FWS	United States Fish and Wildlife Service
GHG	Greenhouse gas
HCP	Habitat Conservation Plan
HQ	Hazard Quotient
IRWM	Integrated Regional Watershed Management
IS/MND	Initial Study/Mitigated Negative Declaration
LD50	Lethal Dose 50
LNU	CAL FIRE Sonoma-Lake-Napa Unit
LOC	Level of concern
MND	Mitigated Negative Declaration
NAHC	Native American Heritage Commission
NCCP	Natural Community Conservation Plan
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOAEL	No Observable Adverse Effect Level
NPDES	National Pollution Discharge Elimination System
NPE	Nonylphenol polyethoxylate
NRCS	Natural Resources Conservation Service
RCD	Resource Conservation District
RPF	Registered Professional Forester
SRCD	Solano Resource Conservation District
SWRCB	State Water Resources Control Board
RWQCB	Regional Water Quality Control Board
USACE	US Army Corps of Engineers (USACE)
USDA	United States Department of Agriculture
USFS	USDA - Forest Service
VELB	Valley Elderberry Longhorn Beetle
WCB	Wildlife Conservation Board

I. BACKGROUND INFORMATION

A. Project Background

From August 17 to October 2, 2020, the LNU Lightning Complex burned 363,220 acres as the fourth-largest wildfire in the recorded history of the State of California, as of 2020. In Solano County, the LNU burned over 42,000 acres, destroyed 309 homes, damaged 84 structures, and killed two people. This devastating event killed tens of thousands of trees, and many have succumbed in the years since. Clean-up and recovery efforts began immediately with the replacement of 1,426 utility poles. Some of the efforts to restore electric power and reenergize the distribution grid involved the felling of burnt trees deemed hazardous to the utility lines. Further efforts to fall and remove trees were done with FEMA funding under the CalRecycle program, which targeted trees that were located no more than two times the tree height from a public road.

The Solano Resource Conservation District (SRCD) received a USDA- Forest Service Post-Fire Disaster Recovery Grant to plan and implement post-fire disaster recovery treatments within the 2020 LNU Lightning Complex. Under USDA-Forest Service's legal authorities for cooperative forestry, recovery work may include hazard tree removal, removal of dead trees and fuels, preparation of sites for revegetation, invasive plant control, fuels treatments, revegetation, wood product utilization, and maintenance of revegetated areas. This grant will allow work to begin, but it will not be sufficient to accomplish the entirety of the project. Additional sources of funding will also be sought.

Many dead trees remain from the LNU Lightning Complex (LNU) in Solano County. These trees become increasingly unstable as decay continues. This project proposes three primary actions to improve riparian health within the LNU wildfire area in Solano County: 1) Removal of fire-killed and dying trees in riparian corridors on private property to prevent harmful impacts to riparian function and water quality, 2) Targeted removal of invasive populations of *Arundo donax* (arundo) and *Tamarix parviflora/T. ramosissima* (tamarisk) from waterways to enhance water quality and improve watershed function, and 3) Revegetation of waterways and riparian areas with native plants.

Arundo donax (arundo) was introduced into California in the early 1800s to control erosion and has expanded throughout many of the waterways of the State, including in Solano County. Arundo is a giant reed grass, growing in excess of 30 feet. Its structure varies from dense, flow-diverting thickets to small, scattered clumps. For decades, various organizations and agencies have attempted to reduce or remove arundo and tamarisk (*Tamarix parviflora* and *T. ramosissima*). However, approximately 256 acres of arundo and about 200 acres of *Tamarisk* spp. remain along 96 miles of creeks and waterways in the Ulatis and Putah Creek Watersheds in Yolo and Solano Counties. The Yolo and Solano County Resource Conservation Districts are embarking on a concerted effort to eradicate arundo and tamarisk from the region. This is a concerted effort between the neighboring counties with the shared goal of watershed and forest restoration following the LNU wildfire event in the greater Ulatis-Putah-Cache Watershed.

B. Project Summary and Stage of CEQA Development

Public Document. This completed draft CEQA document will be filed by the Solano County RCD and will be circulated for a 30-day State agency and public review period.

Final CEQA Document. This final CEQA document contains changes made considering comments received during the public and agency review period.

Project Title:	Post-Fire Riparian Forest Restoration and Arundo Eradication Project, Solano County, CA
SCH File No.:	TBD
Project Location:	Solano County
Name of Property Owner:	Various private properties
Name of Applicant:	Solano County Resource Conservation District (Solano RCD)
Acreage of Project:	123,320
General Plan Designation:	Numerous
Zoning Districts:	Various
Lead Agency:	Solano County Resource Conservation District (Solano RCD)
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II. DESCRIPTION OF PROJECT AND ENVIRONMENTAL SETTING

A. Project Description

Introduction and Project Need

The Solano Resource Conservation District (SRCD) plans to implement a large-scale watershed restoration project in the Ulatis and Putah Creek Watersheds (Figure 2) to address impacts from both the LNU Lightning Complex wildfires in 2020 and over a century of noxious weed invasion in riparian corridors. This project aims to remove priority trees identified in SRCD-conducted surveys that pose a threat to riparian habitats and to remove populations of invasive *Arundo donax* (arundo) and *Tamarisk spp* (tamarisk).

The 2020 LNU wildfire killed many trees in the watercourses of the Ulatis and Putah Creek watersheds. These trees are at risk of falling, or have fallen, into the watercourses. As the trees fall there is an increased risk of bank destabilization, which could lead to erosion and siltation into the watercourse. Although some Large Woody Debris in the watercourse can help improve habitat, an excess of woody debris can cause damming, stream diversion and plugging of culverts at road crossings. The trees are beginning to decay and in some locations are an immediate hazard to structures or facilities. This project proposes removal of trees in watercourse zones. Trees selected for removal will have the following characteristics: 1. Be killed by fire, 2. Be in a location where imminent tree failure will result in stream bank destabilization or cause excessive woody debris to be deposited in the watercourse, and 3. Can be safely mitigated using either a chainsaw or mechanized felling equipment. Priority for removal will be given to trees that meet the following criteria: 1. Affecting a watercourse with fish or amphibian habitat, 2. In a location where removal of the tree is feasible, and 3. In a location where mechanized felling equipment could be utilized.

Removal of invasive arundo and tamarisk is imperative for watershed function, water quality, and improved riparian habitat. Arundo is a bamboo-like perennial grass up to 8m (25 ft.) tall that grows in riparian habitat, forming large dense stands and using three times the amount of water used by native riparian vegetation (DiTomaso 2007). Unlike native riparian plants, arundo provides little shading to the in-stream habitat, leading to increased water temperatures and reduced habitat quality for aquatic wildlife. Aquatic species also require native leaf litter, and the litter from arundo plants is coarser, breaks down more slowly and is generally of a poorer quality for native invertebrates (Dudley & Going, 2007). Once established, arundo can out-compete and completely suppress native vegetation and significantly alter aquatic and riparian habitat (DiTomaso 2007). Sensitive wildlife species are at risk due to the presence and proliferation of arundo, including threatened species such as the fall-run Chinook salmon and the federally listed Valley elderberry longhorn beetle.

Populations of Arundo and tamarisk are prolific in the Ulatis and Putah Creek Watersheds and are impacting numerous physical and biological processes in the riparian areas. Large stands of arundo have formed dense thickets that increase bank erosion and alter stream morphology by trapping sediment, diverting water, and pushing low flows into alternate channels. This can result in flooding and occasional farmland loss (Cal-IPC 2011, Higgins & Kamman 2010). Infrastructure is also at risk due to arundo (Cal-IPC 2011). Arundo growing in the riparian area alters the flood regime by increasing floodplain roughness and raising peak flow water levels, creates unstable banks due to its poorly developed root systems that easily fragment, and contributes to bridge and flood control structure failure by becoming lodged against bridge pylons and blocking and diverting flows.

Eventually, enough water backs up against the bridge or other structure causing the structure to fail or flows to bypass the structure, causing extensive damage. The Arundo removal work proposed by this project will build directly on the Central Valley mapping of arundo by the California Invasive Plant Council (Cal-IPC 2019) which is funded by the California Wildlife Conservation Board.

Tamarisk is a small tree or shrub native to North Africa, Europe, and the Mediterranean. It was originally introduced in North America as a bank stabilization mechanism and has since spread throughout a wide range in North America. The plant has an extensive root system that can withstand heavy flooding, which increases its ability to out-compete native riparian vegetation. It also consumes more water than native riparian plants and secretes salt that increases soil salinity, further reducing the ability of native plants to out-compete tamarisk (Zouhar 2003). An overgrowth of Arundo and tamarisk also increases fire risk and puts the watershed at risk of impacts from fire and flood suppression efforts.

An initial assessment of the project area revealed that many target trees and invasive species populations are difficult to access due to topography and risk of bank damage. The proposed project will focus on areas that can be safely accessed by personnel and equipment to have maximum benefit for riparian health. Removal of riparian invasive species allows native vegetation to re-establish, restores stream morphology, and reduces the risk of erosion, fire, and flooding.

Site Description

The project area encompasses a total of 123,230 acres in a rural agricultural zone of Northern California, between Sacramento and the San Francisco Bay Area (refer to Figure 2, project area map). Tree removal will be focused in the Pleasants Valley area within the easternmost reach of the LNU Lightning Complex in Solano County. Pleasants Creek flows north into Putah Creek, while the Ulatis, Alamo and Sweany creeks comprise the 150-square-mile Ulatis watershed. Tamarisk and arundo removal will be focused in the Ulatis watershed, which drains into the Sacramento-Bay Delta Watershed. This is vital area for water quality protection and improvement.

Project activities will be concentrated along the active channel and floodplain within stream corridors, though some efforts will extend to higher elevation banks as needed to meet project goals. The stream corridor encompasses the stream channel and the adjacent areas that are directly shaped or influenced by hydrologic and geomorphic processes (Figure 2). Key components stream morphology include:

- The channel **thalweg**: the main channel alignment that follows the path of minimum elevation and carries water during low-flow conditions, or the lowest point in the channel;
- The **active channel**: includes the low flow channel and adjacent bar surfaces that are mostly unvegetated and inundated at times of moderately high discharge;
- The **floodplain**: the relatively flat area adjacent to the stream channel created by depositional processes associated with lateral migration of the stream channel; and
- **Terrace** surfaces: an abandoned floodplain created under an earlier set of hydrologic conditions. Terraces are typically perched at a higher elevation than the

active floodplain.

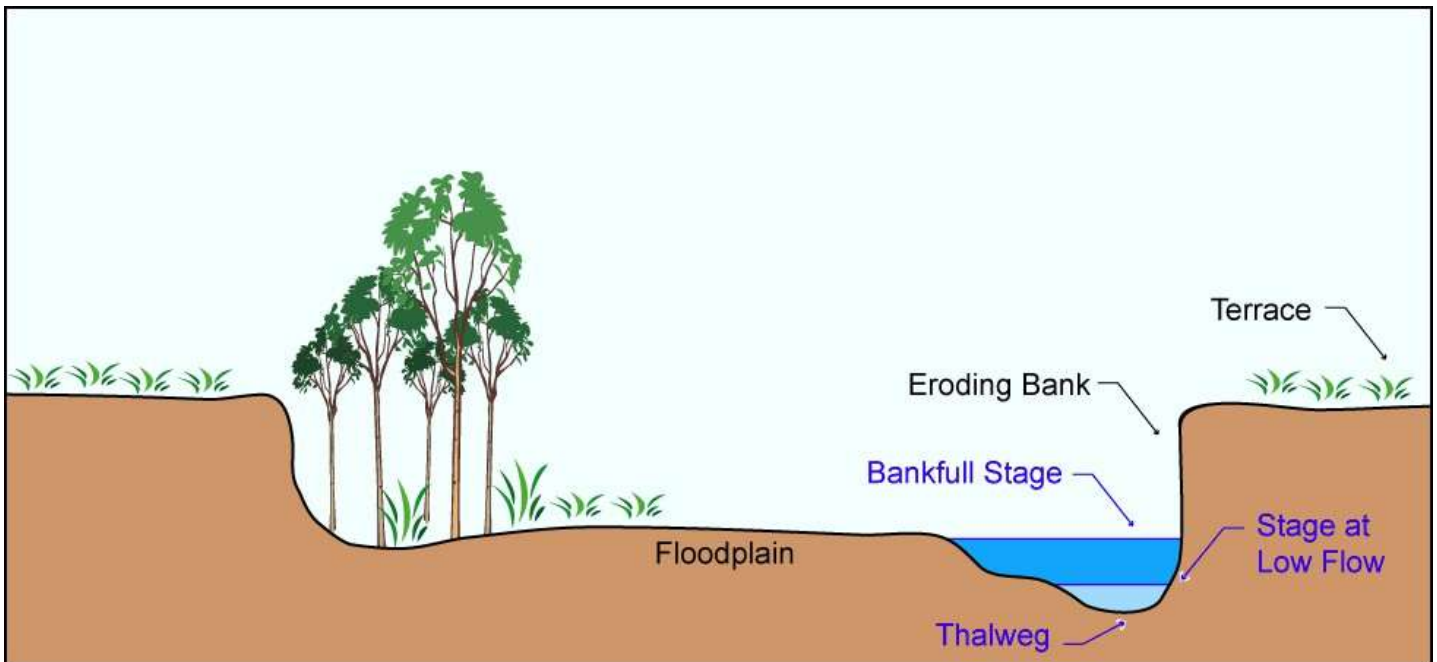


Figure 1. Schematic illustrating the primary components of the stream corridor in cross-sectional profile.

The alignment and configuration of the stream channel changes over time due to episodic cycles of sediment erosion, transport, and deposition that frequently rework streambed material. The present alignment and channel configuration is just one component of a much broader stream corridor through which the channel migrates laterally by natural geomorphic processes. Concurrent processes of streambank erosion and floodplain sedimentation dissipate energy during peak flow events, allow for maintenance of a stable channel profile, and sustain a variety of aquatic and riparian habitats that depend on relatively frequent disturbance.

A number of factors have altered the riparian vegetation characteristics within the Ulatis and Putah Watersheds over the last 150 years. The construction of the Putah Diversion Dam in 1957 resulted in downcutting of Pleasants Creek, which has worsened as floodwaters from the Pleasants Valley watershed enter the now-managed Putah Creek at a gradient. This phenomenon, combined with agriculture-related land clearance in riparian woodland, introduction of non-native plants, and livestock impacts, has resulted in highly disturbed riparian systems in the Ulatis and Putah Watersheds.

The floodplains within the stream corridor are frequently dominated by non-native plants such as salt cedar, arundo, Tree of Heaven, and Ravenna grass. Invasive, non-native plants have been known to alter the ecologic, hydrologic, and geomorphic conditions of the stream corridor. Arundo and tamarisk, for example, tend to grow in dense stands which trap and stabilize alluvial sediments and can trigger aggradation on floodplain surfaces. This can result in channel narrowing, decreased channel capacity, and increased overbank flooding. Stabilization of mid-channel or lateral gravel bars can direct flows toward the opposite bank and result in streambank erosion.

Existing Land Use

Solano County encompasses a rich mixture of rural, agricultural, and urban areas located in California's oak woodland, chaparral, and grassland environments. The Pleasants Valley area includes each of these resources and contains both public and private lands with abundant agricultural resources and wildlife habitat. The Putah Creek Wildlife Area lies just north of the project area.

The primary land uses in the Ulatis and Putah Creek Watersheds include upland grazing, irrigated pasture, agricultural land (orchards, vineyards, annual row crops and field crops), urban areas and public and private open space. Grazing occurs in the foothills, Vaca Mountains and portions of the valley floor. Croplands, vineyards, and orchards cover the flat portions of the valley, encroaching into the foothills.

Water quality and supply are critical to agricultural and economic livelihoods in Solano County and surrounding communities, who rely on functioning watersheds and healthy forests. This project aims to restore these ecosystem services and provide health and human safety in the Pleasants Valley project area.

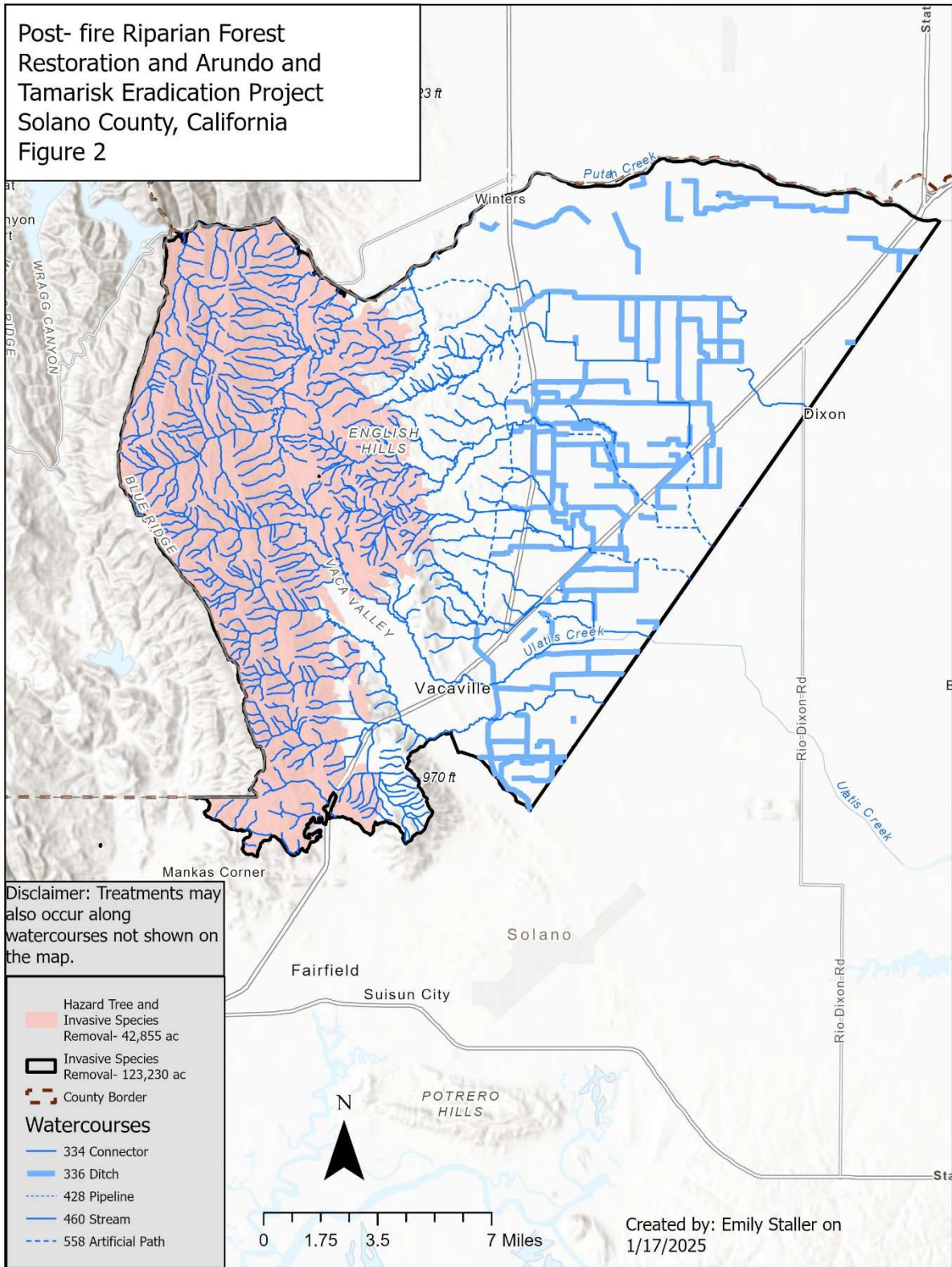
B. Project Partners and Proponents

Solano Resource Conservation District

The Solano Resource Conservation District (SRCD) is a non-regulatory Special District of the State of California, established in 1956 to provide flood protection and soil conservation. SRCD works on a wide variety of projects, including a focus on environmental education and outreach, habitat restoration and conservation, agriculture, water, and wildfire protection. By working closely with a variety of partners on public and private lands, including Solano County, local cities and agencies, the Natural Resources Conservation Service (NRCS) and landowners and community members, SRCD offers a wide variety of services that meet local environmental needs and challenges. Our on-the-ground watershed stewardship work integrates with our environmental education work to reach a diverse audience of stakeholders in Solano County's urban and rural landscapes. The SRCD's mission and goals are:

- Restore Solano County watersheds and natural resources to health
- Protect natural resources through vibrant partnerships, strategic restoration, and effective education programs
- Educate children and adults about watershed science and effective stewardship
- Enhance our watersheds and their habitats to better serve all beneficial purposes

Post- fire Riparian Forest Restoration and Arundo and Tamarisk Eradication Project
 Solano County, California
 Figure 2



Additional Project Proponents

Solano County Water Agency (SCWA) provides water from Ulatis Creek to cities and agricultural lands in Solano County. SCWA is a wholesale water supply agency providing untreated water to cities and agricultural districts in Solano County from the Federal Solano Project and the North Bay Aqueduct of the Water Project. In addition, the agency performs flood management as well as habitat conservation activities.

The California Invasive Plant Council (Cal-IPC), a non-profit dedicated to protecting California's lands and waters from invasive plants, has mapped arundo in the Central Valley using WCB funding and supports this project with detailed project mapping and technical support.

C. Other Public Agencies Whose Approval is Required

Federal Agencies

US Army Corps of Engineers (USACE)

The project may operate under US Army Corps of Engineers (USACE) Nationwide Permit #27 (Riparian Restoration), which will allow completion of the 404 process, unless USACE determines project activities do not require 404 certification.

US Fish and Wildlife Service

All project methods and approaches are designed in accordance with US Fish and Wildlife's (USFWS) avoidance and minimization measures to allow for a "no adverse effects" determination. During project work, if a scenario arises where listed species under USFWS jurisdiction could be impacted, work will cease in that area and not be continued until USFWS is consulted.

State Agencies

State Water Resources Control Board/Regional Water Quality Control Board

A State Water Resources Control Board/Regional Water Quality Control Board (SWRCB/RWQCB) 401 certification will be obtained if it is determined that certification is required for the project. This would likely be under the National Pollutant Discharge Elimination System (NPDES) program with the US EPA.

California Department of Fish and Wildlife

SRCD is preparing an application to the California Department of Fish and Wildlife (CDFW) Lake and Streambed Alteration (LSA) Agreement, per Fish and Game Code section 1602, to cover the project area. Conditions outlined in this initial study and CEQA Mitigated Negative Declaration (MND) are expected to be consistent with the LSA Agreement and with other regulatory agency requirements. The SRCD and its partners have previously obtained LSA Agreements for individual weed management and riparian restoration projects and will work closely with CDFW and other permitting agencies to meet all permit requirements.

California Office of Historic Preservation

Records searches shall be conducted prior to implementation of ground-disturbing treatments and newly discovered archaeological sites will be recorded with the Office of Historic Preservation. Refer to Section V, Environmental Checklist, items E and R for more information.

Tribal Relations

The Yocha Dehe Wintun Nation tribe has been consulted throughout the development of the project through regularly scheduled meetings. A monitoring agreement will be established with the Cultural Resources Department and protocols established for cultural monitors and cultural sensitivity training.

D. Project Methods and Specifications

Specifications for proposed project work are summarized below. All project work must incorporate mitigation measures as detailed in Section V, Environmental Checklist.

1) Hazard Tree Removal

Site Planning

A tree removal plan will be prepared for each project site where tree removal is proposed. This plan will include the following:

1. A tree list and site map.
2. Notes on access.
3. A list of BMPs and environmental mitigations.
4. Tree removal and disposal specifications.

Trees identified for removal will be felled using one of the following methods:

Manual Tree Removal

Trees may be directionally felled away from the watercourse. Trees may be felled from the base. The direction of felling shall be controlled using wedges, power jacks, and/or ropes/cables. The chainsaw operator may fall the tree in segments from a bucket truck or trailer. Tree segments may be lowered down using lines or a crane. It is not anticipated that chainsaw operators will climb trees due to advanced decay.

Mechanical Tree Removal

Trees may be felled using heavy equipment with integrated saws or shears and a tree grapple. This equipment can reach up the stem of a tree, cutting segments and lowering them to the ground in a controlled manner.

Small-Diameter Material

Limbs, tops, and boles that are under 12 inches in diameter may be chipped in place or lopped and scattered in place. Chips shall not be deposited within 20 feet of the bankfull edge of the watercourse and should not be placed in a position where they could be easily moved downstream and into the watercourse zone. Chips shall be broadcast so that chip depth does not exceed 6 inches. Lopped and scattered material shall not exceed 12 inches in depth.

Primary Transport of Material

Where access allows, cut material (boles and large limbs) larger than 12 inches in diameter shall be moved to a decking (landing) location. Transport equipment may include wheeled tractors, specialized skidding tractors with a log grapple and or a winch line, skid steers or mini tracked loaders with log grapples, or self-loading trucks or trailers. Material shall be

transported along pre-determined routes to the decking location. Material shall be transported with at least one end of the piece suspended from the ground. Following use of the pre-determined routes, water breaks constructed of native dirt shall be installed where the grade of the path exceeds 5% slope. Refer to mitigation measures in Section V, Environmental Checklist, Item G.

Decking of Material

Material shall be decked on site in areas approximately $\frac{1}{4}$ - $\frac{1}{2}$ acre in size or smaller. Decks will be placed in relatively level locations which do not require grading to facilitate log storage. Material will be stacked and loaded into trucks using an excavator or similar tractor with log grapples. If material is to be utilized for wood chips, logs may be chipped onsite directly into a truck to be hauled to the end use facility. Following use, exposed soil in the decking location shall be grass seeded or mulched with chips.

Transport to End Use Facility

Material shall be transported using log trucks or bulk material trailers. If wood chips are manufactured onsite, chip trailers or chip vans will be utilized.

2) Mechanical Treatment of Invasive Arundo and Tamarisk

Mowing

Where arundo and tamarisk exist in larger stands or clumps, they may be moved using tracked or rubber-tired equipment (up to 50,000 lb.) with fixed teeth mowing heads. Material may also be chipped. Mowing and chipping should not result in movement of plants or mulched material outside of the footprint of the original arundo or tamarisk stand. Mulched or chipped material shall not exceed 6 inches in depth. While some native vegetation may need to be cut to facilitate access for equipment, native vegetation that is 6 inches in diameter at breast height (DBH) or greater shall not be cut.

Hand Cutting

Smaller populations or individual plants may be treated by hand using a chainsaw or other hand tools or may be treated with herbicide alone (see Item 3 below). Generally, hand treatment will be reserved for sensitive or steep areas. Hand cut material that is isolated or scattered may be left in place to decay naturally or may be stacked and mowed in previously mowed areas or outside the riparian area on compacted soils, dirt roads and shoulders that have no native vegetation. Material may also be chipped and transported to an end-use biomass facility. If cut and left onsite, Arundo and tamarisk will be placed outside of the flood zone. Crew size shall be limited to 25 or fewer individuals. No more than one crew will operate at a given site, and no more than three work sites will be active in the watershed at once.

Refer to Table 2 for a timeline of invasive species control methods.

3) Chemical Treatment of Invasive Arundo and Tamarisk

Herbicide treatment of arundo and tamarisk shall occur between July 16th and November 30th (refer to Table 2). Treatment may consist of initial foliar or cut-stump treatment of individuals or smaller clumps, or treatment of re-sprout following initial removals. Herbicide will be applied with backpack sprayers in accessible areas. In areas where invasive species populations are low, plants may be treated with herbicide and left to decompose naturally. Treatments may be repeated regularly until 100% control is achieved, which can take up to 10 years.

Similar projects involving invasive species control in nearby Yolo County have reported a high success rate in eradication of non-native invasive species using glyphosate, imazapyr, and triclopyr. These active ingredients have a high level of efficacy, especially where combined with each other or with adjuvants/surfactants. As a result, these three ingredients have been analyzed in detail within this Mitigated Negative Declaration. If, during project work, it becomes necessary to employ another active ingredient that has not been analyzed in this MND, a supplemental analysis will be prepared by SRCD prior to using the chemical in riparian areas. Only herbicides with aquatic formulations available may be utilized for this project. Dye may be added to the herbicide mix to allow for visualization of drift and coverage, and surfactant may be used to ensure efficacy. Broadcast of herbicide using boom or large aircraft is not proposed. Refer to mitigation measures in the Environmental Checklist for restrictions related to the handling, transport, and application of herbicides.

Foliar Application

This method will be reserved primarily for small scattered stands of arundo that are generally under 0.25 acres in size. In these areas, stalks may be left standing after treatment to decay over time or may be cut as described in Item 2 above. Repeated spraying may be necessary to gain full control. Imazapyr, glyphosate, and triclopyr are all suitable for foliar application.

Direct Stalk or Stump Application

A concentrated chemical mixture is applied to freshly cut stumps or to small cuts made in the stalks of arundo and/or tamarisk. Imazapyr, glyphosate, and triclopyr may be used for cut-stump applications. This method is not suitable for areas that have been mowed – hand cutting is required.

4) Revegetation

Following mechanical and chemical treatment of arundo and tamarisk or dead tree removal, some sites may require native plantings for additional bank stabilization or to prevent re-infestation by invasive, non-native species. Revegetation will focus on establishing native riparian understory shrub cover, perennial sub-shrub cover, and native vines. Species composition will be tailored to each revegetation site with the goal of shading out invasives, restoring bank stability, and decreasing the risk of erosion.

- Seeds, cuttings, and/or container plants may be used for revegetation, and generally will be planted in fall/winter/spring when soils are moist.
- Planting densities will generally be 200 to 400 plants per acre, with a 5-year goal of 150 plants per acre. Inter-planting may need to occur in successive years

- Irrigation may be necessary in particularly dry or sandy sites.
- Generally, revegetation will occur within 2 years of invasive species removal by any method described above
- Mulch (rice free/weed free straw or wood) and/or biodegradable erosion control blankets or mats may be used to cover bare mineral soils around newly planted individuals. These methods increase the survivorship of native plantings by reducing erosion from rainfall and holding moisture near the soil surface.
- Crew size shall be limited to 25 or fewer individuals. No more than one crew will operate at a given site, and no more than three work sites will be active in the watershed at once. Workers shall make every effort to avoid treading in stream channels.

Native Riparian and Upland Revegetation Strategy

According to the California Riparian Habitat Restoration Handbook (July 2009), the project objectives to remove hazardous materials following devastating wildfire will be the first step in restoring natural processes in the watersheds of Ulatris Creek and Pleasants Valley. Much of the natural seed bank exists within the site coverage. Seed trees will remain on site, but natural regeneration will be supplemented with seeding and planting of native plugs and plants where necessary. Typically, areas where invasive species have been removed will be revegetated within two years. Retreatment with herbicide may be implemented for up to ten years to ensure complete control of non-native plants. Revegetation strategies will be tailored to the site and adjusted as needed to restore hydrologic function and riparian habitat.

Native woody vegetation has stronger root structure than arundo and tamarisk, which shear and rip during high flows, leading to soil loss and bank failure. Where necessary, bank stabilization within the biomass reduction zones will be achieved through native revegetation (i.e., non-structural) bioengineering methods. The Natural Resources Conservation Service (NRCS) (19981) defines bioengineering as, “Integrating living woody and herbaceous materials with organic and inorganic materials to increase the strength of the soil. This is accomplished by a dense matrix of roots which hold the soil together. The above-ground vegetation increases the resistance to flow and reduces flow velocities by dissipating energy. The biomass also acts as a buffer against the abrasive effect of transported materials and allows sediment deposition due to low shear stress near the bank.”

In contrast, traditional engineered approaches to streambank stabilization include riprap, concrete revetments, bulkheads, concrete-lined channels, etc. There are also bank stabilization structures constructed from wood in lieu of rock and concrete that fall into the realm of bioengineering methods. For purposes of this project, only revegetation-type bioengineering will be employed because structural bioengineering approaches require significant funding for earth work and repair of bank disturbance resulting from construction.

A list of some native plant species occurring in the project area is below. These and other native species will be targeted for both natural recruitment and/or planted in the project area as needed.

Table 1. Typical Site Plant Palette for Revegetation

<i>Latin name</i>	<i>Common Name</i>
Trees	
<i>Alnus rhombifolia</i>	White alder
<i>Populus fremontii</i>	Fremont cottonwood
<i>Salix goodingii</i>	Goodings black willow
<i>Quercus lobata</i>	Valley Oak
<i>Acer negundo</i>	Box elder
<i>Fraxinus latifolia</i>	Oregon ash
<i>Platanus racemose</i>	Sycamore
Shrubs	
<i>Baccharis salicifolia</i>	Mulefat
<i>Cephalanthus occidentalis</i>	Buttonwillow
<i>Salix exigua</i>	Sandbar willow
<i>Baccharis pilularis</i>	Coyote bush
<i>Sambucus nigra ssp. caerulea</i>	Elderberry
<i>Cornus sericea</i>	Red twig dogwood
<i>Rhus trilobata</i>	Skunkbush
<i>Cercis occidentalis</i>	Redbud
<i>Aesculus californica</i>	California buckeye
Sub-shrubs, forbs, vines, grasses	
<i>Artemisia douglasiana</i>	Mugwort
<i>Rosa californica</i>	California rose
<i>Clematis ligusticifolia</i>	Clematis
<i>Vitis californica</i>	California grape
<i>Rubus ursinus</i>	California blackberry
<i>Oenothera elata ssp. hookeri</i>	Evening primrose
<i>Grindelia camporum</i>	Gum plant
<i>Asclepias fascicularis</i>	Narrow-leaf milkweed
<i>Asclepias speciosa</i>	Showy milkweed
<i>Muhlenbergia rigens</i>	Deer grass
<i>Elymus triticoides</i>	Creeping wild rye
<i>Carex barbarae</i>	White root sedge

5) Maintenance

Effective control of invasive species following planting is critical to survivorship. The arundo and tamarisk treatment process is expected to take 10 years to achieve 100% control of invasive species. Sites that have had revegetation with natives and/or arundo and tamarisk biomass reduction (mowing or hand cutting) will have ‘low- impact maintenance’ where arundo and tamarisk re-sprouts are treated using backpack sprayers. Watering of plantings may also occur as well as control of annual weeds (hand pulling or backpack spraying). These activities will not use gas-powered equipment or any mechanical equipment such as tractors. A water tank and pump can be used for watering, but only if located outside the riparian

habitat on adjacent roads or staging areas. Native woody vegetation is not disturbed or entered, and no flowing or standing water is entered.

E. Project Timeline

1) Arundo and Tamarisk Treatment

See Table 2 below for a timeline of invasive species removal. The timing of these activities avoids or minimizes impacts to wildlife, fish and native plants by avoiding work during breeding season, and work dates are based on restrictions dictated by active CDFW Lake and Streambed Alteration (LSA) agreements (1602 permits) for similar restoration programs in the Ulatis Creek watershed.

Table 2. Arundo and Tamarisk Eradication Work Timeline

	Passive Work (maintenance)	Active Work (herbicide treatment, biomass handwork)	Active Work (biomass mowing)	Planting	No Work
Work Activity	Watering, backpack herbicide treatment, and hand weed control only (no mechanical/ powered equipment or cutting)	Herbicide treatment, cutting and hauling biomass, chipping: Smaller mechanical equipment & chippers.	Biomass reduction (mowing) with tractors	Planting container plants and cuttings, seeding	No work, only monitoring allowed
Dates of Occurrence	May 1 – July 15	July 16 – Nov 30	Sep 1 – Nov 30	Nov 1 – Feb 29	March 1 – April 30
Restrictions	Restricted to areas where target biomass has been removed and/or re-vegetation is occurring. No avian survey required.	Avian pre-surveys required July 16 to Aug 15.		Restricted to areas where target biomass has been removed and/or re-vegetation is occurring.	No project work permitted.
Sensitive Biological Activities Occurring	Avian breeding, insect adult emergence, plant reproduction	Possible avian and insect activity			Avian nesting
Work status in water flows	No work in flowing water		No work in flowing water, but crossing water allowed.	No work in flowing water	No work in flowing water.

2) Tree Removal Treatment

Tree removal may occur during any time of the year, with the following restrictions:

- a. When heavy equipment is being utilized, equipment use will be limited to times when soil is

not saturated and outside of periods where it has been continuously raining for more than 30 minutes. After rain ceases, the site will be allowed to dry for 24 hours before work resumes. Saturated soils are defined as follows: “Soil and/or surface material pore spaces are filled with water to such an extent that runoff is likely to occur. Indicators of saturated soil conditions may include, but are not limited to: (1) areas of ponded water, (2) pumping of fines from the soil or road surfacing material during Timber Operations, (3) loss of bearing strength resulting in the deflection of soil or road surfaces under a load, such as the creation of wheel ruts, (4) spinning or churning of wheels or tracks that produces a wet slurry, or (5) inadequate traction without blading wet soil or surfacing materials.”

- b. When work is proposed between March 1st and August 15th, nesting bird surveys must be completed prior to start of work. Refer to survey protocol in Mitigation Measure BIO-6, under Item D of the environmental checklist.

III. SUMMARY OF FINDINGS

This Draft Initial Study and Mitigated Negative Declaration (IS/MND) has been prepared to assess the project’s potential effects on the environment and the significance of those effects. Potentially significant environmental effects could result from the proposed project. SRCD will implement Mitigation Measures, which will eliminate or reduce environmental impacts to a less-than-significant level.

Based upon this Draft IS/MND, SRCD has determined that the proposed project would have no significant effects on the environment once Mitigation Measures are implemented. SRCD has found, from the entire record, that there is no substantial evidence that the proposed project 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 project would result in no impacts to Agriculture and Forest Resources, Air Quality, Energy, Land Use Planning, Population and Housing, Public Services, Recreation, and Transportation.
- The project would have impacts below a level of significance for Aesthetics, Greenhouse Gas Emissions, Noise, Utilities and Service Systems, and Wildfire.
- Mitigation Measures would be implemented to reduce potentially significant impacts to less-than- significant levels for Biological Resources, Cultural Resources, Tribal Cultural Resources, Geology and Soils, Hazards and Hazardous Materials, and Hydrology and Water Quality.
- The project would not substantially degrade the quality of the environment. It is anticipated that the project would benefit the habitat for riparian habitat and special status species.
- The project would not achieve short-term environmental improvement to the disadvantage of long-term environmental improvement.
- The project would not have environmental effects that are individually limited but cumulatively considerable.
- The project would not have environmental effects that would cause substantial adverse

effects on human beings, either directly or indirectly.

- The project incorporates all applicable Mitigation Measures described in the initial study Environmental Checklist.
- The Mitigated Negative Declaration reflects the independent judgment of the Lead Agency.

IV. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED AND DETERMINATION

A. Factors

The environmental factors checked below would be potentially affected by this project, as discussed within the checklist on the following pages.

- | | | |
|---|---|---|
| <input type="checkbox"/> Aesthetics | <input type="checkbox"/> Agriculture Resources | <input type="checkbox"/> Air Quality |
| <input checked="" type="checkbox"/> Biological Resources | <input checked="" type="checkbox"/> Cultural Resources | <input checked="" type="checkbox"/> Geology/Soils |
| <input checked="" type="checkbox"/> Hazards/Hazardous Materials | <input checked="" type="checkbox"/> Hydrology/Water Quality | <input type="checkbox"/> Land Use/Planning |
| <input type="checkbox"/> Mineral Resources | <input type="checkbox"/> Noise | <input type="checkbox"/> Population/Housing |
| <input type="checkbox"/> Public Services | <input type="checkbox"/> Recreation | <input type="checkbox"/> Transportation/Traffic |
| <input checked="" type="checkbox"/> Tribal Cultural Resources | <input type="checkbox"/> Utilities/Service Systems | |

B. Determination

On the basis of this initial evaluation:

- I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the proposed project could have a significant effect on the environment there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- I find that the proposed project 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 project 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 project, nothing further is required.

V. ENVIRONMENTAL CHECKLIST: ANALYSIS OF POTENTIAL ENVIRONMENTAL IMPACTS

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
A. Aesthetics.				
Will the Project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which will adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The project area has occurrences of arundo, tamarisk and other target non-native vegetation in riparian areas. In some areas these non-native plants have 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. The treatment of non-native riparian vegetation will not influence the aesthetic condition of the watershed. The project would remove stands of arundo and other target non- native plants from riverine areas that have limited public access. Views of the river from most areas are from a distance of more than 100 feet. Changes in vegetation composition are not likely to significantly alter the view. Rock formations and river channel areas may have increased visibility after the project restoration has occurred – a benefit to the scenic view. Water bodies are typically considered positive visual features. Arundo removal will have the long-term effect of saving mature native trees by reducing the risk of wildland fires and catastrophic flooding throughout the system, which have negative effects on scenic vistas. The net effect will be neutral to beneficial for scenic riverine and coastal vistas by removing non-native vegetation that is impacting these resources.

The portion of the project within the LNU fire footprint will have select dead trees removed within 100 feet of watercourses. The dead tree removals will only constitute a minor, less than 1%, component of the existing fire killed dead trees in the project area.

There are no officially designated scenic highways in Solano County or the project area. The project

does not propose any use of outdoor lighting and no buildings are proposed and thus there can be no associated light reflection/glare.

The project will control hazard vegetation and non-native vegetation within the waterways of Solano County; however, visual impacts are expected to be temporary and minor as selected plants are being controlled and re-vegetation will occur. Therefore, the proposed project will not have any substantial adverse effect on a scenic resource within the Project area.

Impact: The project will have a less than significant impact on aesthetics. No mitigation proposed.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
B. Agriculture and Forest Resources.				
Would the project:				
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 Project of the California Resources Agency, to non- agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forestland (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: Within the project vicinity there are lands designated as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance and grazing land. The project will not convert agricultural resources to non-agricultural use. Therefore, there will be no potentially significant impacts to or cumulative level conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance to a non-agricultural use as a result of this project.

The proposed project will not result in a conflict in zoning for agricultural use because none of the existing agricultural uses in the Watershed or project areas would be displaced nor would future

agricultural uses be precluded as a result of project activities. Additionally, the project site is not under a Williamson Act Contract. Therefore, there will be no conflict with existing zoning for agricultural use, or a Williamson Act contract.

Tree removal proposed under this project is limited to dead tree removal and thus will not result in the loss of forest land.

Timberland zoning will not be affected by this project.

Impact: The project will have no impact on agriculture and forest resources. No mitigation proposed.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
C. Air Quality.				
Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The project will use machinery to complete project activities. Emissions from the use of any equipment would be minimal, temporary and localized, resulting in pollutant emissions below the screening-level criteria established by County guidelines for determining significance. The vehicle trips generated during project work will not exceed 50 Average Daily Trips (ADTs). According to the Bay Area Air Quality Management District CEQA Guidelines for Assessing the Air Quality Impacts of Projects and Plans, projects that generate less than 2,000 ADT are below the screening-level criteria established by the guidelines for criteria pollutants. As such, the project will not violate any air quality standard or contribute substantially to an existing or projected air quality violation.

Air quality emissions associated with the project include emissions of PM10, NOx and VOCs from project implementation (use of equipment and biomass reduction), and also as the result of temporary increases in traffic during project implementation. Emissions from the active work phase

would be minimal, localized and temporary resulting in PM10 and VOC emissions below the screening-level criteria established by County guidelines for determining significance.

The proposed project as well as the past, present and future projects within the surrounding area, have emissions below the screening-level criteria established by County guidelines for determining significance, therefore, the emissions associated with the proposed project are not expected to create a cumulatively considerable impact nor a considerable net increase of PM10, or any O3 precursors.

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. 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.

Impact: The project will have no impact on Air Quality. No mitigation proposed.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
D. Biological Resources.				
Will the project:				
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 Wildlife or the U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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 Wildlife or the U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on wetlands as defined by the Department of Fish and Wildlife (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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: The project aims to improve habitat conditions for all native biological species in the area. On a project-level scale, target non-native invasive plant species will allow native plants to reoccupy portions of the project area where they were eliminated by the encroachment of the target non-native invasive plant species, particularly Arundo and tamarisk. The tree removal portion of the project will have a positive impact on bank stability and result in a reduction of sediment inputs into watercourses, having a positive impact on fish and amphibians. Dead trees will be used as snags and large woody debris source material as some trees are not feasible to fell.

A query of the California Natural Diversity Database (CNDDDB) was carried out in January 2025 for species in the project area defined as the project area plus a three mile buffer. Refer to Tables 3, 4, 5, 6, 7, 8, and below 9 below for a summary of the CNDDDB search. Species that would occur or utilize the riparian vegetation and habitat types worked are included in the analysis presented in the checklist. These areas represent the whole project area. Fifty-four species in total, 23 flora and 31 fauna, were evaluated for potential negative impact from the project. The species are summarized in Tables 3, 4, 5, 6, 7, 8 and 9 below. Tables include a description of the species habitat, listing status, and statement on the species' potential to occur in the project area. Species with potential to occur in the project area are further evaluated in the section following each table.

Overview of Potential Direct Impacts to Biological Resources:

Direct impacts to biological resources could occur through project restoration activities. Direct impacts could occur as physical take or harassment of species (flora and fauna). To avoid these impacts, work methods and activities follow strict timing and activity restrictions (Table 2). The timing of work activities minimizes work when biological resources are actively reproducing and/or migrating through work areas. The type of work activity in a given timeframe is designed to minimize and avoid impacts. These include general measures as well as task specific measures related to treatment, biomass reduction, planting and maintenance. Mitigation Measures are presented below for specific species to assure that impacts are avoided or minimized to a level that is not significant.

Overview of Herbicide Analysis for Biological Resources:

Risk assessments for the herbicides that will be used in this project are based on procedures used by the US Forest Service (Syracuse Environmental Research Associates SERA 2011&2014). 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, 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 project 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 2011&2014). The study used toxicity values (NOAEL, preferably) derived from tests conducted with glyphosate formulations that contained surfactants. Because of the additional toxicity that may be contributed by surfactants, formulated product assessments are more conservative in their approach than assessments of active ingredients alone. 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 reduces 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. Imazapyr's mode of action works by inhibiting the synthesis of certain amino acids produced by plants (but not animals). Imazapyr is an amino acid synthesis inhibitor and kills plants by inhibiting the production of the branched-chain aliphatic amino acids which are required for DNA synthesis and growth. Upland formulations may contain surfactants that can contribute additional toxicity to the formulation, principally to aquatic organisms. This project will use aquatic approved formulations of imazapyr for treatments. Imazapyr based products are most frequently applied as foliar sprays, using a wide variety of application equipment including backpack sprayers and power handguns, but the herbicide may also be used on cut stem surfaces and as low volume applications of more concentrated material. Research summarized by the United States Forest Service (USFS) assessed the toxicological impact of imazapyr-based herbicides on non-target wildlife species using the HQ method (SERA 2011&2014). The study used toxicity values (NOAEL, preferably) derived from tests conducted with glyphosate formulations that contained surfactants. 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. Imazapyr'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 (Garlon 3-A): 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 and power handguns but may also be used on cut stem surfaces and 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 2011&2014). 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.

Refer to Checklist Item I – Mitigation Measures HAZ-1 and HAZ-2 for mitigations relating to the application of herbicide.

Resources discussed below include special status plants (ESA listed and/or CNPS Rare Plant Rank 1 or 2), invertebrates, fishes, amphibians, reptiles, birds, and mammals. “Special status species” include all species tracked by CNDDDB potentially occurring in the Project Area or within a 3-mile buffer of the project area and include all those which meet the CEQA definition of Endangered, Rare, or Threatened (Figures 3-5, see CEQA Guidelines, § 15380).

1. Special Status Plant Species:

Twenty-three special-status plants were evaluated for their potential to occur in the work area. Seventeen of these plant species are restricted to vernal pool and saline habitats, where project work is not proposed. The remaining 6 species have potential to occur within the project area 3 of these plants are listed under ESA. The remaining have one of the following rare plant rankings: California Rare Plant Rankings: 1A Plants presumed extirpated in California and either rare or extinct elsewhere; 1B Plants rare, threatened, or endangered in California and elsewhere; 2A Plants presumed extirpated in California but common elsewhere; 2B Plants rare, threatened, or endangered in California but more common elsewhere. Additional sensitive plants species that have CNDDDB data records but do not have suitable habitat within the project area are also included. Refer to Table 3.

Table 3. Special Status Plants

Plants				Listing		CNPS
Common Name	Scientific Name	Habitat	Distribution in project area	Fed	State	
Adobe lily	<i>Fritillaria pluriflora</i>	Adobe clay soils in the coastal range foothills.	There are 2 located in the CNDDDB search. Suitable habitat may exist within the project area.			1B.2

Alkali milk-vetch	<i>Astragalus tener</i> var. <i>tener</i>	Low ground, alkali flats, and flooded lands in alkali playas	There are 5 located in the CNDDDB search. Project work is not proposed in suitable habitat.			1B.2
Brittlescale	<i>Atriplex depressa</i>	Alkali scalds or alkaline clay meadows or annual grasslands in chenopod scrubs, playas, and valley and foothill grasslands, meadows and sometimes vernal pools. 1-320 meters. April-October	There is 1 located in the CNDDDB search. Project work is not proposed in suitable habitat.			1B.2
California alkali grass	<i>Puccinellia simplex</i>	Valley grassland, alkali-flats, wetland-riparian.	There is 1 located in the CNDDDB search. Project work is not proposed in suitable habitat.			1B.2
Contra costa goldfields	<i>Lasthenia conjugens</i>	Vernal pools and wetlands.	There are 5 located in the CNDDDB search. Project work is not proposed in suitable habitat.	FE		1B.1
Coulter's goldfields	<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	Alkali sink, coastal salt marsh, freshwater wetlands, wetland-riparian.	One CNDDDB record 1927, near Dunnigan, extirpated. Possibly extirpated. Project work is not proposed in suitable habitat.			1B.1
Ferris' milk-vetch	<i>Astragalus tener</i> var. <i>ferrisiae</i>	Sub-alkaline flats on overflow land in meadows and valley and foothill grasslands. Usually seen in dry, adobe soil. 5-75 meters. April-May	There is 1 located in the CNDDDB search. Project work is not proposed in suitable habitat.			1B.1
Heartscale	<i>Atriplex cordulata</i> var. <i>cordulata</i>	Alkaline flats and scalds within chenopod scrub, grassland, and meadows.	One CNDDDB extirpated record north of Davis. Project work is not proposed in suitable habitat.			1B.2
Holly-leaved ceanothus	<i>Ceanothus purpureus</i>	Grows in woodland and chaparral habitat	There is 1 located in the CNDDDB search. Project work is not proposed in suitable habitat.			1B.2
Keck's checkerbloom	<i>Sidalcea keckii</i>	Valley grassland, foothill woodland	There are 6 located in the CNDDDB search. Suitable habitat may exist within the project area.	FE		1B.1
Pappose tarplant	<i>Centromadia parryi</i> ssp. <i>parryi</i>	Grassland, coastal salt marshes, alkaline springs, seeps.	There are 4 located in the CNDDDB search. Project work is not proposed in suitable habitat.			1B.2

Two-fork clover	<i>Trifolium amoenum</i>	Typically wetlands, wetland-riparian and valley grassland.	There are 4 located in the CNDDDB search. Suitable habitat may exist within the project area.	FE		
Recurved larkspur	<i>Delphinium recurvatum</i>	Poorly drained, fine, alkaline soils in grassland, atriplex scrub	There is 1 located in the CNDDDB search. Suitable habitat may exist within the project area.			1B.2
Dwarf downingia	<i>Downingia pusilla</i>	Vernal pools, roadside ditches	There are 2 located in the CNDDDB search. Project work is not proposed in suitable habitat.			2B.2
San joaquin spearscale	<i>Etriplex joaquinana</i>	Alkaline soils	There are 3 located in the CNDDDB search. Project work is not proposed in suitable habitat.			1B.2
Brewer's western flax	<i>Hesperolinon breweri</i>	Chaparral or grassland, occasionally on serpentine	There are 5 located in the CNDDDB search. Suitable habitat may exist within the project area.			1B.2
Carquinez goldenbush	<i>Isocoma arguta</i>	Alkaline soils, flats, low hills, grassland	There is 1 located in the CNDDDB search. Project work is not proposed in suitable habitat.			1B.1
Legenere	<i>Legenere limosa</i>	Wet areas, vernal pools, ponds	There are 2 located in the CNDDDB search. Project work is not proposed in suitable habitat.			1B.1
Baker's navarretia	<i>Navarretia leucocephala ssp. Bakeri</i>	Vernal pools	There are 8 located in the CNDDDB search. Project work is not proposed in suitable habitat.			1B.1
Bearded popcornflower	<i>Plagiobothrys hystriculus</i>	Wet grassland, vernal pool margins	There are 2 located in the CNDDDB search. Project work is not proposed in suitable habitat.			1B.1
Suisun marsh aster	<i>Symphyotrichum lentum</i>	Marshes	There is 1 located in the CNDDDB search. Project work is not proposed in suitable habitat.			1B.2
Saline clover	<i>Trifolium hydrophilum</i>	Salt marshes, open areas in alkaline soils	There are 3 located in the CNDDDB search. Impacts from the proposed project are unlikely as work in salt marshes is not proposed, but grassland			1B.2

			habitat may be impacted.			
Oval-leaved viburnum	<i>Viburnum ellipticum</i>	Chaparral, yellow-pine forest, generally n-facing slopes	There are 2 located in the CNDDDB search. Suitable habitat may exist within the project area.			2B.3

All species and habitat information was sourced from Calflora, CalScape, CNPS, and CNDDDB (2025).

Work Activities

Treatment methods including herbicides are being used in this invasive non-native plant control project. Application methods will ensure 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. Biomass removal (cutting, hauling, and chipping) will occur so that special status plant species are not impacted/affected. Chipped biomass will be spread within the footprint of the removed non-native plants or spread over degraded areas with either no plant cover or only non-native annual cover. Mowing of dense arundo and tamarisk stands will occur in the Ulatis Creek Watershed and Pleasants Valley. Endemic plant species with narrow ecological ranges are unlikely to occur in the project work areas as these areas are dynamic flood zones with frequent disturbance and noxious weed inundation. Native plant communities will be retained and untreated in their occurrences, however and where feasible.

Tree removal activities have some potential to impact listed plants through mechanical damage to the plant in tree felling, skidding, or the grading of roads or landing areas. Such activities are highly localized and do not represent a large footprint within the project area. Where trees are to be removed, equipment pathways and decking locations will be identified by a RPF or Arborist. The RPF, Arborist, or other qualified biologist will conduct focused surveys to avoid special status plants as part of the locating of equipment pathways and decking locations.

Herbicide Analysis for Botanical Resources

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 into 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 this herbicide.

Species Descriptions

Species accounts are given below for three plant species that could occur in work areas and for three Federal and State listed plants known to occur or likely to occur in Solano County.

Adobe lily (*Fritillaria pluriflora*)

California ranks it as 1B.2. The perennial herb is native and endemic to California. It can grow up to 4 inches tall. Blooming period is February to April. Habitat of the herb is found in chaparral, foothill woodland, and valley grassland. Two CNDDDB records from the MND project area were observed. Botanical surveys will be performed by a qualified biologist prior to implementation of project activities. Any observed plants will be flagged, reported to SRCD, and avoided.

Two-fork clover (*Trifolium amoenum*)

Listed as Federally endangered. California has it ranked as CNPS 1B.1. Species was once thought to be extinct until rediscovery in 1993 in Occidental, Sonoma County, California. It inhabits grassy swales, wetlands, foothills and other grasslands. Two phenotypes are present, the erect variety grows up to 68 centimeters (27 inches tall) and the prostrate variety that grows close to the ground. Botanical surveys will be performed by a qualified biologist prior to implementation of project activities. Any observed plants will be flagged, reported to SRCD, and avoided.

Keck's checkerbloom (*Sidalcea keckii*)

Listed as Federally endangered. California ranks it as CNPS 1B.1. It is endemic to California. This annual herb in the mallow family grows 1.5 – 3.3 decimeters (6 – 13 inches) tall. It flowers April through May. Habitat is best described as grassy slopes in valley grasslands and foothill woodlands. One CNDDDB record from 1977 from foothill woodland near Ulati Creek, additional records on Calflora, but all in grasslands or foothills. Botanical surveys will be performed by a qualified biologist prior to implementation of project activities. Any observed plants will be flagged, reported to SRCD, and avoided.

Oval-leaved viburnum (*Viburnum ellipticum*)

California ranks it as CNPS 2B.3. The deciduous shrub can grow to be 3 to 9 feet tall. Oval-leaved viburnum is found in drier open woods, bottom lands, chaparral, or shrub thickets. Two CNDDDB records from the MND project area were observed. Botanical surveys will occur prior to assigned work on the ground. Any observed plants will be flagged, reported to SRCD, and avoided.

Recurved larkspur (*Delphinium recurvatum*)

California ranks it as CNPS 1B.2. The perennial herb is native and endemic to California. The blooming period occurs from March to June. Habitat of the species is within poorly drained, fine, alkaline soils in grassland. One CNDDDB record from the MND project area was observed. Botanical surveys will be performed by a qualified biologist prior to implementation of project activities. Any observed plants will be flagged, reported to SRCD, and avoided.

Brewer's western flax (*Hesperolinon breweri*)

California ranks it as CNPS 1B.2. It is an annual herb that is native and endemic to California. The herb can grow up to 7 inches in height. The flowering period is from May to June. Habitat of this species is found in chaparral or grassland, occasionally on serpentine. Four CNDDDB records from the MND project area were observed. Botanical surveys will be performed by a qualified biologist prior to implementation of project activities. Any observed plants will be flagged, reported to SRCD, and avoided.

Impact: Impacts to special status plant species presented in Table 3 are potentially significant for both tree removal operations and arundo and tamarisk treatments. Implementation of BIO-1 will reduce potential impacts to a less than significant level.

Mitigations for Special Status Plants

BIO-1: Special Status Plants

- a. Focused surveys of suitable habitat shall be conducted by a qualified biologist prior to the start of work.

Surveys for **tree removal areas** shall focus on:

- a. *Fritillaria pluriflora*
- b. *Hesperolinon breweri*
- c. *Sidalcea keckii*
- d. *Viburnum ellipticum*
- e. *Delphinium recurvatum*
- f. *Trifolium amoenum*

Surveys for **arundo and tamarisk treatments** shall focus on:

- a. *Lasthenia conjugens*
- b. *Sidalcea keckii*
- c. *Trifolium amoenum*

Surveys for **crossing construction** shall focus on all of the above species.

- b. If one of the sensitive plant species listed above is detected during surveys, zones of 15 feet around the plant or outermost individual in a group of plants shall be flagged with “Special Treatment Zone” flagging.
- c. For **tree removal operations**:
 - i. Tracked or wheeled equipment shall not be allowed to enter these zones except on existing roads and trails.
 - ii. Removal of trees may occur within these zones. Trees must be suspended out of the buffer zone without disturbing special-status plants; i.e., trees shall not be dragged over special-status plants, workers shall not trample special-status plants, etc.
 - iii. Chips or other woody material may not be broadcast into these special treatment zones.
 - iv. If a special-status plant species is detected during operations, all work will cease until the RPF is notified and appropriate buffer zones have been flagged as described above.
- d. For **arundo and tamarisk treatments**:
 - i. Mowing shall not be allowed within plant protection zones as described in Item b above.
 - ii. Hand-cut material shall not be piled within zones described in Item b above. Invasive species may be hand-cut within zones and removed to an area outside the zone where they may be chipped, mowed, or left in place.
 - iii. Herbicide treatment within these zones shall be limited to targeted hand-spraying of glyphosate. Soil-active herbicides shall not be used.
 - iv. When spraying herbicide within plant protection zones, a 5-gallon bucket, shield, or other device shall be used to protect rare plants during application.
 - v. If a special-status plant species is detected during operations, all work will cease until the project manager is notified and appropriate buffer zones have been flagged as described above.

2. Special Status Invertebrates

Seven special-status invertebrates were evaluated for their potential to occur in the project area. Suitable habitat exists for five of these invertebrates, which were evaluated for potential impacts under the proposed project.

Table 4. Special Status Invertebrates

Insects			Listing	
Common Name	Scientific Name	Distribution in project area	Federal	State
Valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	There are 12 located in the CNDDDB search. Potential impacts to suitable habitat from project work are possible.	FT	SSC
Obscure bumble bee	<i>Bombus caliginosus</i>	There is 1 located in the CNDDDB search. Potential impacts to suitable habitat from project work are possible.	None	None
Crotch's bumble bee	<i>Bombus crotchii</i>	There are 2 located in the CNDDDB search. Potential impacts to suitable habitat from project work are possible.		Candidate; FP

Western bumble bee	<i>Bombus occidentalis</i>	There are 3 located in the CNDDDB search. Potential impacts to suitable habitat from project work are possible.		Candidate; FP
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	There are 15 occurrences located in the CNDDDB search. All are located east of the project area in the Central Valley, where grassland and vernal pool habitat are more common. This species requires vernal pool habitat. Project work is not proposed in or near vernal pool habitat; therefore, no impact is anticipated and this species was not analyzed further.	FT	
Monarch – California overwintering population	<i>Danaus plexippus plexippus pop. 1</i>	A monarch area of conservation emphasis (ACE) is located within 1 mile of the project area near the city of Fairfield. Suitable habitat for overwintering is not present, but suitable breeding habitat may be present.		PT
Vernal pool tadpole shrimp	<i>Lepidurus packardii</i>	There are 3 occurrences located in the CNDDDB search. This species requires vernal pool habitat. Project work is not proposed in or near vernal pool habitat; therefore, no impact is anticipated and this species was not analyzed further.	FE	

Federal Listing: FT = Federally listed as Threatened, FE=Federally listed as Endangered, PT = Proposed threatened
State Listing: SSC = Species of Special Concern, FP = State Fully Protected, E= Endangered, T = Threatened

Work Activities

Treatment methods using herbicides are being used by the invasive non-native plant control project. Herbicides listed below are demonstrated to have very low toxicity to insects. The insect species of concern, Valley elderberry longhorn beetle, is dependent on its host plant for survival so protection measures below are focused on protecting elderberry plants. Application methods will ensure that herbicides are applied to target plants only, but specific buffers are listed below along with herbicide type restrictions. Manual control methods (pulling/extraction) will be applied to target invasive non-native plants only. Biomass removal (cutting, hauling, and chipping) will occur in a manner that assures that elderberry plants are not impacted/affected. Chipped biomass will be spread within the footprint of the removed non-native plants or spread over degraded areas with either no plant cover or only non-native annual cover. Work areas will be surveyed prior to project activities to assure that no elderberry plants are impacted. Refer to Mitigation Measure BIO-2 below.

Tree removal has the potential to affect special status species primarily through damaging or destroying host plants. This potential is somewhat limited due to the unlikelihood that impacts to a host plant would be extensive enough to kill the plant. However, impacts to native flowering shrubs and elderberry plants are possible during creation of landings and skid trails for transport and decking of cut material. Crossing construction could also impact elderberry plants.

Herbicide Analysis for Biological Resources

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 imazapyr 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.

Species Descriptions and Potential Impacts

Crotch's bumble bee (*Bombus crotchii*)

Habitat is in grasslands and shrublands. Species require a hotter and drier environment than other bumblebee species. Since they have shorter tongues than other *Bombus* species, their habitat is more defined by available pollen and nectar produced by smaller flowers. Typically, they nest underground in abandoned rodent burrows or above ground in tufts of grass, old bird nests, rock piles and tree cavities. Mated queens overwinter and forage for food until the worker bees in the colony are able to help.

Western bumble bee (*Bombus occidentalis*)

Bumble bees require flowering resources for the entirety of their flight season. They are highly dependent on subalpine and montane meadows. Climate change, livestock grazing, logging, and recreation are all historical and current threats to these habitats throughout the region. (Peet et al. 2000; Aldridge et al. 2011).

Effects on listed bees from tree removal operations:

Impacts would be greatest in areas cleared for landings or skid trails. In the context of the larger available habitat in the project area and the limited scope of plant disturbance proposed with tree removal the hazard tree portion of the project will not have a significant impact on listed bees.

Effects on listed bees from arundo and tamarisk treatment:

In areas where arundo mitigation involves mowing, there is potential to impact individual native plants that may provide habitat for listed that will be mowed in addition to the target species. However, due to the abundance of native flowering shrub habitat within the watershed and the

benefits associated with removal of invasive species and revegetation with native riparian plants, this impact is not significant, and no mitigations are proposed.

Impacts to special-status bees are less than significant. No mitigation is proposed.

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 males live for four to five days while adult females live up to three 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 41 recorded occurrences of VELB within the project area in the California Natural Diversity Database (CNDDDB). Based upon this information, VELB can be assumed to be present in the project area.

VELB adults may be active during tree removal work, and VELB in the pupa and/or larva stage may 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 project area are individual plants, as opposed to 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 project 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. Elderberry plants could also be impacted during mowing of invasives, or during

hazard tree removal if elderberry plants are damaged by falling material, skid trail construction, or landing construction.

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.

Impacts to elderberry plants supporting valley elderberry longhorn beetle are potentially significant. Incorporation of Mitigation Measure BIO-2 will reduce potential impacts to a less than significant level.

Monarch Butterfly – California Overwintering Population (*Danaus plexippus plexippus* pop.

1)

This population of monarch butterfly follows an annual migration pattern between the California coast and the mountainous western portions of the United States, and is proposed threatened under the Federal Endangered Species Act. Monarchs generally leave their overwintering sites in February and March and reach the northern limit of their range in North America by mid-June. These insects lay eggs almost exclusively on milkweed plants (*Asclepias spp.*) Larvae emerge and use milkweed as a food source before pupating into adult butterflies. In spring and summer, adults have emerged and lay eggs for another generation of butterflies. Several generations may occur in northern ranges before adults of the final fall generation migrate south to overwintering sites. In California, most overwintering sites are concentrated on the coast as monarchs prefer above-freezing temperatures and high humidity (Western Monarch Milkweed Mapper 2025).

It is possible that the project area contains some suitable habitat for individual monarchs as the project area lies within potential spring and summer breeding areas for the species. However, the climate of the project area is not suitable for overwintering of large populations of monarchs due to freezing temperatures. Proposed project activities are unlikely to have a significant impact on this species. Removal of invasive arundo and tamarisk and revegetation with native species, including *Asclepias spp.*, will benefit monarch nectaring and egg-laying habitat within the project area. Refer to Table 1 for a list of native species likely to be used in revegetation.

Impacts to the California overwintering population of monarchs are less than significant. No mitigation measures are proposed.

Mitigations for Special-Status Invertebrates

BIO-2: Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*) (Adapted from “Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle, USFWS 2017).

For all project operations:

- a) Project areas will be pre-checked for the presence of elderberry plants. Where present, individual elderberry plants with a stem diameter of 1 inch or greater or clumps of elderberry plants will be flagged for retention.

- b) 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.
- c) A qualified biologist will monitor the work area at appropriate intervals to assure that all avoidance and minimization measures are implemented.
- d) 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).
- e) The following protection measures shall be implemented within 20 feet of elderberry shrubs:
 - Target plants shall be hand cut. Invasive species less than 1 inch DBH may be pulled with a weed wrench only when doing so does not damage elderberry roots.
 - Mowing is not allowed within the 20-foot buffer.
 - Foliar spraying shall not occur. Only cut-stump applications are permitted.
 - Imazapyr or other soil-active herbicides will not be utilized.
- f) In addition to the restrictions outlined in Item 5 above, the following protection measures shall be implemented within the dripline of elderberry shrubs:

Mechanical weed removal within the dripline of the shrub will be done with hand tools rather than chainsaws, will be limited to the season when adults are not active (August - February) and will avoid damaging the elderberry.

3. Special Status Fish Species

The CNDDDB search revealed four special-status fish within the assessment area. All four species are unlikely to occur in the project area as they are usually restricted to the low flow main channel of the Sacramento River, which is not part of the project area.

Table 5. Special Status Fish Species

Fish		Habitat	Distribution in project area	Listing	
Common Name	Scientific Name			Fed	State
Chinook salmon-Central Valley spring run ESU	<i>Oncorhynchus tshawytscha</i>	Cool, deep-water pools for adult summer holding habitat; shallow streams with gravels and cold water for spawning and rearing habitat; rivers with complex edge habitats and vegetation for cover for downstream-migrating juveniles. ^a	Spring-run Chinook salmon use the Sacramento River as summer holding habitat, while they migrate to upstream tributaries to spawn, and also when juveniles migrate downstream to the ocean. ^{b,c} Unlikely to occur in project work areas (Sacramento River only).		SSC

Chinook salmon-Sacramento River winter run	<i>Oncorhynchus tshawytscha</i>	Upstream adult spawning migration December-August; shallow streams with gravels and cold water for spawning and rearing habitat; rivers with complex edge habitats and vegetation for cover for downstream-migrating juveniles during July- March. ^a	Winter-run Chinook salmon use the Sacramento River as habitat while they migrate to upstream tributaries to spawn, and also when juveniles migrate downstream to the ocean. ^b Unlikely to occur in project work areas (Sacramento River only).		SSC
Central Valley fall-run Chinook salmon	<i>Oncorhynchus tshawytscha</i>	Mature adults enter rivers in October-November moving quickly to spawning streams; juveniles stay in streams 1-7 mo. often out-migrating in turbid water during storms; forage on floodplains prior to entering San Francisco Bay estuary	Fall-run Chinook salmon use the Sacramento River as habitat while they migrate to upstream tributaries to spawn; juveniles use tributaries for out-migration and floodplains for foraging and growth before entering salt-water estuary and the ocean. Opportunistic migrant in Ulatis Creek, established run unlikely. ^c Unlikely to occur in project work areas (Sacramento River or no work period).		SSC
Steelhead-Central Valley ESU	<i>Oncorhynchus mykiss irideus</i>	Deepwater river channel for upstream adult spawning migration; shallow streams with gravels and cold water for spawning and rearing habitat; rivers with complex edge habitats and vegetation for cover for downstream-migrating juveniles. ^a	Central Valley steelhead use the Sacramento River as migratory habitat; spend summer months resting in pools with consistent cool temperatures waiting for winter rains to spawn Dec-Feb.; adults migrate back to ocean in March; juveniles out-migrate April – June. Possibly found in Ulatis Creek, not confirmed. ^d Unlikely to occur in project work areas (Sacramento River or no work period).	FT	

Federal Listing: FT = Federally listed as Threatened, FE=Federally listed as Endangered

^a LSA Associates Inc. 2009. Yolo County 2030 Countywide General Plan EIR.

^b California Department of Fish and Wildlife (CDFG). 2019. California Natural Diversity Database (CNDDDB). Last updated March 2018. Special-status species occurrences in Yolo County. Wildlife and Habitat Data Analysis Branch, California Department of Fish and Wildlife, Sacramento, California.

^c Moyle, P.B., Yoshiyama, R.M., Williams, J.E., and Wikramanayake, E.D. 1995. Fish Species of Special Concern in California, Second Edition. California Department of Fish and Wildlife, Sacramento, California.

^d Moyle and Young 2019. Personal communication.

^e TRPA Fish Biologists November 2022 Ulatis Flood Control Project Fish Survey https://scwa2.com/wp-content/uploads/2023/06/Ulatis-2022-Memo_FINAL_27-June-2023.pdf

Work Activities

Treatment methods using herbicides are being used by the invasive non-native plant control project. Herbicides listed below are demonstrated to have very low toxicity to fish. Application methods will ensure that herbicides are applied to target plants only, with no application to surface waters (refer to Item I, Mitigation Measure HAZ-1). Biomass removal (cutting, hauling, and chipping) will occur in

a manner that assures that no material is deposited into surface waters during work activities. Chipped biomass will be spread within the footprint of the removed non-native plants or spread over degraded areas with no plant cover or non-native annual cover. Mowers will cross the low flow channel periodically to reach stands of non-native vegetation (refer to Item J, Mitigation HAZ-4). Crossings will be minimized to the fewest possible to complete work. Mowing occurs in the fall (September 1 – November 30th) when flows are lowest and fish migration does not occur.

Tree removal operations could have the potential to impact fish should felled trees land in an area of the creek where fish are present or be felled and left in a watercourse causing damming and flow diversion.

Herbicide Analysis for Fish Species

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.

Species Descriptions and Potential Impacts

Chinook Salmon (*Oncorhynchus tshawytscha*) - Central Valley Spring Run, Sacramento River Winter Run, and Central Valley Fall and Late-fall Run ESUs: Chinook salmon are anadromous fish that require both oceanic habitat for the majority of their adult lives and freshwater riverine and stream habitat for migration, spawning, and juvenile rearing. The Central Valley of California has three distinct Evolutionarily Significant Units (ESUs), each with unique genetics and life history patterns, which are designated by the season that they migrate to spawn.

Central Valley spring run chinook salmon migrate upstream in the spring, where they then hold in deepwater pools during the summer months, finally traveling upstream to spawn during the fall. Although this ESU was once widely distributed in the Sacramento-San Joaquin River system, its current spawning range consists only of Butte, Mill, Deer, Antelope, and Beegum Creeks, tributaries to the Sacramento River. Threats to this ESU include loss of genetic integrity through hybridization with fall-run salmon, small non-hybridized population size, and loss of habitat through damming activities. Critical Habitat has been designated for this ESU and is comprised of 37 watersheds in California, not including Ulatis Watershed.

Central Valley fall and late fall-run chinook salmon (*Oncorhynchus tshawytscha* pop.13) migrate upstream in late summer and fall, and spawn in the late fall, with variations from stream

to stream. This ESU is currently the most abundant in the Central Valley, and many smolts are released from hatchery programs each year. The influence of hatcheries on the genetics of this ESU is of concern, as is the general population size, which has decreased from its historic levels. Loss of habitat to damming activity is also a concern for this ESU. No Critical Habitat has been designated for this ESU.

Sacramento River winter run chinook salmon (*Oncorhynchus tshawytscha*) migrate upstream in the Sacramento River during winter and spring, and spawn spring through late summer. Historically, winter run Chinook spawned high upstream in Sacramento River tributaries, including the Pit, McCloud, and upper Sacramento Rivers. These areas are now inaccessible due to dams, which has negatively affected the population. Critical Habitat has been designated for this ESU and is comprised of the Sacramento River from Keswick Dam (River Mile 302) to the margin of the Sacramento-San Joaquin Delta (River Mile 0) and all waters from Chipps Island westward to the Golden Gate Bridge.

Steelhead (*Onchorhynchus mykiss irideus*) – Central Valley ESU: Central Valley steelhead are anadromous trout that historically ranged throughout the Sacramento and San Joaquin River drainages. Their current range still encompasses these two river systems, but with less continuity and far fewer numbers. They have a polymorphic life history, whereby juvenile fish with either the anadromous steelhead trout or the coastal rainbow trout life history pattern can assume a life history different from their parents. This may be important in allowing them to survive fluctuating conditions in the Central Valley. Primary threats to the species include introduction of hatchery stock/loss of genetic integrity, a substantial loss of habitat for spawning and rearing due to dam construction, and water temperature and volume fluctuations. Critical Habitat has been designated for this species in 67 watersheds in California.

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 freshwater 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 freshwater stream to spawn. Unlike Pacific salmon, steelhead do not necessarily die after spawning and are able to spawn more than once.

CNDDB searches indicate that the winter distribution of the steelhead extends into the project area via Mix Canyon and Alamo Creek. Additionally, the entirety of the project is within range of species. However, local knowledge of the area indicates that Mix Canyon and upper reaches of Alamo Creek are intermittent watercourses that are unlikely to support persistent salmonid populations, only occasional migrants. These creeks are in the very upper ranges of the species and individuals are unlikely to be in the project area. Impacts to this species from tree removal activities could include input of large woody debris or accidental deposition of sediment or chips by equipment during tree removal operations. However, without proposed tree removal, fire-killed trees would fall in an uncontrolled manner into watercourse zones, potentially creating issues of

flooding, sedimentation, and an over-abundance of large woody debris. For invasive arundo and tamarisk treatments, all herbicides used by the project in riparian areas are approved for use in wetlands with demonstrated low toxicity, posing no risk to fish species (refer to “herbicide analysis for fish species” above). Mowing of invasives adjacent to streams has the potential to contribute sediment and vegetative material to the watercourse. Temporary crossings of wetted channels are unlikely to impact this species because crossings will not be installed or used between November 15th and May 1st (Mitigation Measure HYD-4) when juveniles have already emerged from gravel substrates.

Impact: Impacts to special-status fish habitat are potentially significant. Implementation of mitigation measures HAZ-1, HAZ-2, HYD-1, HYD-2, HYD-3, and HYD-4 will reduce potential impacts to a less-than-significant level.

Mitigations for Special-Status Fish

Refer to Mitigation Measures HAZ-1, HAZ-2, HYD-1, 2, 3, and 4 (Items I and J of the environmental checklist).

4. Special Status Amphibians

Four special-status amphibians were evaluated for their potential to occur in the project area.

Table 6. Special Status Amphibians

Amphibians:				Listing	
Common Name	Scientific Name	Habitat	Distribution in project area	Fed	State
California tiger salamander - central California DPS	<i>Ambystoma californiense</i> pop. 1	Vernal pools, seasonal wetlands and stock ponds for breeding with underground refuges, often ground squirrel burrows nearby.	There are 12 located in the CNDDDB search. Project work is not proposed in suitable habitat.	FT	T
Foothill yellow-legged frog - north coast DPS	<i>Rana boylei</i> pop. 1	Shallow streams with rocky substrates and partial shade in foothills.	There are 12 located in the CNDDDB search. Suitable habitat may exist within the project area.		SSC
California red-legged frog	<i>Rana draytonii</i>	Lowlands and foothills in or near permanent sources of deep water (generally 20 inches or deeper) with dense, shrubby or emergent riparian vegetation.	There is 1 located in the CNDDDB search. Suitable habitat exists within the project area, and USFWS final critical habitat for this species is located within ¼ mile of the project area in the Suisun Creek watershed.	FT	

Western spadefoot	<i>Spea hammondi</i>	Grasslands and open woodlands, with vernal pools, stock ponds, or other seasonal waterbodies for breeding. When not breeding lives underground in self-constructed and/or small mammal burrows.	There is 1 located in the CNDDDB search. Project work is not proposed in suitable habitat.	PT	
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Federal Listing: FT = Federally listed as Threatened, FE=Federally listed as Endangered
State Listing: SSC = Species of Special Concern, FP = State Fully Protected, E= Endangered, T = Threatened, PT= Proposed Threatened

Work Activities

Arundo and tamarisk treatment: Treatment methods using herbicides are being used by the invasive non-native plant control project. Herbicides listed below are demonstrated to have very low toxicity to fish (which are used as surrogates for larval amphibians by the EPA). Application methods will ensure that herbicides are applied to target plants only, with no application to surface waters. Biomass removal (cutting, hauling, and chipping) will occur in a manner that assures that no material is deposited into surface waters during work activities, and active work will cause sufficient disturbance to encourage mobile individuals to vacate the work area. Chipped biomass will be spread within the footprint of the removed non-native plants or spread over degraded areas with no plant cover or non- native annual cover. Mowers will cross the low flow channel periodically to reach stands of non-native vegetation, which could impact frogs at varying life stages. Crossings will be minimized to the fewest possible to complete work. Mowing occurs in the fall outside of amphibian breeding season when flows are lowest, but mowing could impact amphibians traveling overland during rainy periods.

Hazard tree treatment: Tree removal operations could have the potential to impact amphibians should felled trees land in an area of the creek or upland areas where amphibians are present, or if equipment were to injure or kill individuals during upland dispersal. Mitigation Measure BIO-3 will mitigate this potential impact for special-status frogs.

Herbicide Analysis for Amphibians (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.

Species Descriptions and Potential Impacts

California Tiger Salamander (*Ambystoma californiense*): California tiger salamanders utilize grasslands and oak woodlands below 1,500 feet in elevation with ponds or vernal pools nearby. During the dry season, adults estivate in abandoned ground squirrel and pocket gopher burrows. Large, turbid vernal pools provide ideal habitat for tiger salamander breeding and for the development of aquatic larvae. Streams are rarely used for reproduction. This species has declined significantly, due primarily to loss of habitat due to increased urbanization and loss of wetlands and native grasslands to agriculture. Other significant threats include predation of larvae by introduced predatory fishes and bullfrogs, reduced numbers of rodent burrows due to rodent control efforts, increased death by automobiles on roads, and introduction of other tiger salamander species which may hybridize with California tiger salamanders.

Critical Habitat has been designated for this Central California population. Critical Habitat in Solano County consists of a single unit located approximately 3 miles east of Travis Air Force Base, outside of the project area. Generally, overland movement of salamanders occurs twice a year, when adults migrate to and from underground burrows to breeding ponds. Migration to breeding ponds generally occurs at night after the first November rains. Adults usually return to burrows no more than several weeks following breeding. Larvae mature and exit ponds during late spring or early summer (no later than the first week of July). Generally, individuals do not burrow more than 3300 feet from breeding ponds. CNDDDB records indicate that all nearby occurrences were observed in seasonal mining/ranching ponds, constructed pools, or vernal pools east of I-80 in extensive grassland areas. Proposed project activities are centered around stream riparian areas in oak woodlands/savanna and riparian forests, and are not expected to impact breeding habitat for this species. Due to the location of the proposed project, the minimal above-ground movements of adult salamanders, and the species' requirement to be within 3300 feet of suitable breeding habitat, this project is not expected to have significant impacts on the tiger salamander.

Western Spadefoot (*Spea hammondi*): The CNDDDB search revealed one occurrence of this species, recorded in 1973 east of I-80 in the middle of an agricultural area. Western spadefoot are rarely found on the surface. Most of the year is spent in underground burrows up to 36 in deep, which they construct themselves. Some individuals also use mammal burrows. Recently metamorphosed juveniles seek refuge in the immediate vicinities of breeding ponds for up to several days after transformation. They hide in drying mud cracks, under boards and other surface objects including decomposing cow dung. Breeding and egg laying occur almost exclusively in shallow, temporary pools formed by heavy winter rains. Egg masses are attached to plant material, or the upper surfaces of small, submerged rocks. The western spadefoot ranges throughout the Central Valley and adjacent foothills and is usually quite common where it occurs. Elevations of occurrence extend from near sea level to 4460 ft in the southern Sierra foothills. This species occurs primarily in grasslands, but occasional populations also occur in valley-foothill hardwood woodlands. Some populations persist for a few years in orchard or vineyard habitats. The proposed project is not expected to have a significant impact on temporary pond habitat used for breeding because project

work is focused along streamside riparian corridors. Significant impacts to adults traveling overland are not expected as overland activities are rare and adults are usually in underground burrows. Also, overland movements rarely exceed several meters on rainy nights, and movements to and from breeding ponds are rarely extensive. Therefore, potential impacts on this species as a result of the proposed project are less than significant.

Foothill Yellow Legged frog (*Rana boylei*) – North Coast DPS: Foothill yellow legged frog North Coast DPS 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).

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 post-metamorphs. 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 roughly one 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. boylei* 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 resulting from non-native plant removal are anticipated to have a long-term

benefit to frog habitat. Plants such as arundo, 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 and the food that comes from woody debris and (native vegetation) leaf litter. Removal of arundo will reduce erosion and fine sediment contribution to streams, improving instream conditions for foothill yellow-legged frogs by shifting streambed composition to gravel, pebbles, and large rocks. Normalization of flood processes and fire risk reduction will also benefit the species.

For the arundo and tamarisk treatments, the project work activity period is in late summer/fall. The hazard tree portion of the project may occur at any time where soils are not saturated, and it has not rained for 24 hours. The life phase most potentially affected by the project is the metamorphic period during which tadpoles obtain an adult frog form and could be active in portions of creeks that still have flowing water. Direct impacts are unlikely as these frogs are rarely found far from the water's edge, especially during warmer periods, though direct impacts are possible if frogs are seeking refuge on the stream banks under refugia. Indirect impacts from sedimentation or large woody debris/vegetation input during tree removal and/or mowing are possible.

California Red-legged Frog (*Rana draytonii*): This species is federally threatened under the Endangered Species Act and is a CDFW species of special concern. USFWS has identified final critical habitat for the frog directly east of the project area along Suisun Creek in Napa County. Habitat for California red-legged frog (CARLF) consists of ponds, streams and wetlands with emergent vegetation and open water, typically of a meter or more in depth. This species requires permanent or semi-permanent water sources, as the adults breed during the winter and spring months, after which the aquatic tadpoles require up to 20 months to mature. Adults use rodent burrows as shelters and hibernacula. This species' range is found almost entirely in California and has been considerably reduced through habitat destruction and competition/ predation by non-native bullfrogs and fish. It is currently found in 28 California counties, primarily in the Coast Ranges but with small populations found in the Sierras. Designated Critical Habitat occurs in California in Alameda, Butte, Calaveras, Contra Costa, El Dorado Kern, Kings, Los Angeles, Marin, Mendocino, Merced, Monterey, Napa, Nevada, Placer, Riverside, San Benito, San Joaquin, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Solano, Sonoma, Stanislaus, Ventura and Yuba Counties.

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 and Hayes 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 (YCRCD 2008).

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.

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 native 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),

Vegetation changes resulting from non-native plant removal are anticipated to have a long-term benefit to frog habitat. Plants such as arundo, 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 and the food that comes from woody debris and (native vegetation) leaf litter.

If present, hazard tree removal operations could impact CARLF during wet periods when upland dispersal is occurring.

Impact: Impacts to Foothill yellow legged frog and CA Red Legged Frog are potentially significant. Incorporation of mitigation measures HAZ-1, HAZ-2, HYD-1, HYD-2, HYD-3 and HYD-4 (item J of the checklist) and BIO-3 below will reduce potential impacts to a less than significant level.

Mitigations for Amphibians

BIO-3: Mitigations for Foothill Yellow-Legged Frog and California Red Legged Frog:

- a) For tree removal and mowing of invasive arundo and tamarisk proposed between the first October or November rain amounting to more than ¼ inch and April 31st: prior to tree removal or large woody debris removal, a qualified biologist shall assess the work area via a visual survey to determine if suitable habitat is present. If so, a field survey will be conducted to determine presence. If presence is detected, the occupied portion of the associated watercourse shall not be operated on during the above-mentioned seasonal restriction period, and any work must occur in the presence of a biological monitor.
- b) For all temporary crossing work: If suitable habitat for CARLF or FYLF is present at the location of the proposed crossing, surveys for California red legged frog and foothill yellow legged frog shall be conducted no more than 48 hours before crossing construction. Surveys shall be conducted by a qualified biologist and shall be tailored to the life stage of the frog for the period of construction. If special-status frogs are discovered during surveys, temporary crossing work at that location shall be placed on hold and CDFW shall be consulted per the requirements of relevant Lake and Streambed Alteration Permits.

5. Special Status Reptiles

Two special-status reptiles were evaluated for their potential to occur in the work area.

Table 7. Special Status Reptiles

Reptiles				Listing	
Common Name	Scientific Name	Habitat	Distribution in project area	Federal	State
Western pond turtle	<i>Actinemys marmorata</i> (<i>Emys marmorata</i>)	Completely aquatic, lives in ponds, marshes, rivers, streams, and irrigation ditches with deep pools (about 2 feet or greater); also requires accessible upland habitat for egg laying. Permanent or nearly permanent lakes,	There are 18 located in the CNDDDB search. Suitable habitat may occur within the Project area.		SSC

		ponds, marshes, rivers, streams, & irrigation ditches with aquatic veg. Needs basking sites such as partially submerged logs, vegetation mats, or open mud banks. Nests in suitable uplands, such as sandy banks or grassy, open fields on unshaded, south-facing slopes with less than 25% slope			
Giant garter snake	<i>Thamnophis gigas</i>	Freshwater marsh, edges of flood basins artificial waterways, and irrigation ditches.	One CNDDDB record outside the project area in South Fork Putah Creek. Suitable habitat may occur within the project area.	FT	ST

Federal Listing: FT = Federally listed as Threatened, FE = Federally listed as Endangered
 State Listing: SSC = Species of Special Concern, SFP = State Fully Protected, E = Endangered, T = Threatened

Work Activities

Treatment methods using herbicides are being used by the invasive non-native plant control project. Herbicides listed below are demonstrated to have very low toxicity to birds (which are used as surrogates for reptiles by the EPA). Application methods will ensure that herbicides are applied to target plants only, with no application to surface waters. For arundo eradication, biomass removal (cutting, hauling, and chipping) will occur in a manner that assures that no material is deposited into surface waters during work activities. Chipped biomass will be spread within the footprint of the removed non-native plants or spread over degraded areas with no plant cover or non-native annual cover. Mowing of dense arundo and tamarisk stands will occur throughout the project. Mowers will cross the low flow channel periodically to reach stands of non-native vegetation. Crossings will be minimized to the fewest possible to complete work.

For tree removal operations, trees will be felled or pieced down in a manner that does not impact the wet portions of the watercourse channel. Transport of cut material from the cut tree to the landing will cause some localized disturbance which will be mitigated by applying erosion control to exposed surfaces within 100 feet of watercourses.

Herbicide Analysis for Reptiles (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.

Species Descriptions and Potential Impacts

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 project area. On upper Ulatis Creek there is a CNDDDB record from 1956 in areas where bedrock forms the creek channel. This area is upstream of arundo stands in Pleasants Valley which are characterized by soft substrates in the channel and floodplain (sand and loose rock). The areas where arundo occurs are also characterized by fast moving waters with limited refugia (isolated pools). A record in CNDDDB also occurs on Ulatis Creek near Winters from 1990 and a second population exists at the UC Davis Arboretum Waterway (2001).

Suitable habitat exists throughout the project area, so the potential for the presence of turtles, depending on life stage, is high. The timing of the project work (July 16 to Nov 15, or as dictated by CDFW under the Program's Streambed Alteration Permit) coincides with turtles of various ages being present in the water; nests in grasslands or terraces; 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.

Impacts to Western pond turtle could result from trampling of nests, individuals, and exposure to herbicide (although as indicated above, all chemicals used have very low toxicity for reptiles).

Giant Garter Snake (*Thamnophis gigas*): The giant garter snake historically ranged in the Sacramento and San Joaquin valleys (Rossman et al. 1996). Its current range is much reduced, and it is apparently extirpated south of Fresno Co. except for western Kern Co. (Bury 1971, Rossman et al. 1996). Rossman and Stewart (1987) recognized it as a full species. Primarily associated with marshes and sloughs, less with slow-moving creeks, and absent from larger rivers. Active from mid-March until October (Rossman et al. 1996).

The nature of the home range of garter snakes in California is not well known. There is likely considerable overlap in the home ranges of neighboring individuals. Not thought to be territorial. Although this species is not well studied, other garter snakes have not been observed exhibiting behaviors suggesting territoriality. Extremely aquatic, rarely found away from water, and forages in the water for food (Rossman et al. 1996).

The giant garter snake now is very scarce throughout its range in the Central Valley. Perhaps California's most aquatic garter snake, populations have been eliminated or decimated by the elimination of natural sloughs and marshy areas. Heavy use of pesticides is suspected as a contributing factor in the decline of this once abundant garter snake of the Central Valley. Protection of waterfowl habitat may allow it to survive in a small portion of its original range.

Generally quite aquatic, these garter snakes forage primarily in and along streams taking fish and amphibians and amphibian larvae (Fitch 1941). Most current food may be introduced species such as carp, mosquitofish, and bullfrogs, because the native prey such as blackfish, thick-tailed chub, and red-legged frog are no longer available (Rossman et al. 1996).

The preferred nocturnal retreats of this active diurnal snake are thought to be holes, especially mammal burrows, crevices, and surface objects. During the day the giant garter snake often basks on emergent vegetation such as cattails and tules. In hotter weather, mammal burrows and piles of vegetation may be used as daytime refuges. When disturbed it usually retreats rapidly to water (Fitch, 1940, Rossman et al. 1996).

Courtship and mating normally occur soon after spring emergence. Young are born alive between mid-July and early September, usually in secluded sites such as under the loose bark of rotting logs or in dense vegetation near pond or stream margins. Mean litter size is 23 (Rossman et al. 1996). Courtship and mating occur in the spring soon after emergence. A mean litter of 30 young are born in July and August.

Impacts to giant garter snake could result from trampling of refuges, individuals, and exposure to herbicide (although as indicated above, all chemicals used have very low toxicity for reptiles).

Impacts to western pond turtle and giant garter snake are potentially significant. Incorporation of mitigation measure BIO-4 will reduce impacts to a less than significant level.

Mitigations for Reptiles

BIO-4: Giant Garter Snake and Western Pond Turtle

- a) **For tree removal, mowing, hand cutting, and chipping:** Suitable habitat will be surveyed no more than 72 hours before start of work. Surveys will focus specifically on identifying burrows for giant garter snake and egg-laying sites for Western pond turtle, if seasonally applicable. If occupied sites are discovered during surveys, the following shall apply:

- 1) Occupied habitat shall be treated after individuals have left the area as determined by a qualified biologist; OR
 - 2) Occupied habitat shall be given a 30-foot avoidance zone and work may proceed with a biological monitor on site; OR
 - 3) 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 Wildlife’s Lake and Streambed Alteration Agreement Program.
- b) **For herbicide application:** Pre-survey of suitable habitat is not required. Workers will be instructed to look out for wildlife and burrows and to avoid them while spraying.
- c) **For all temporary crossing work:** Surveys for Giant Garter Snake and Western Pond Turtle shall be conducted prior to crossing construction if suitable habitat exists. Surveys shall be conducted by a qualified biologist and shall be tailored to the life stage of the reptile for the period of construction. Surveys shall cover the crossing footprint and any suitable habitat within 30 feet of the crossing footprint. If giant garter snake or western pond turtle are discovered during surveys, temporary crossing work at that location shall be placed on hold and CDFW shall be consulted per the requirements of relevant Lake and Streambed Alteration Permits.

6. Special Status Mammal Species

Four mammals were evaluated for their potential to occur in the work area.

Table 8: Special Status Mammals

Mammals				Listing	
Common Name	Scientific Name	Habitat	Distribution in project area	Federal	State
American badger	<i>Taxidea taxus</i>	Dry, open shrublands, forest, and grasslands with friable soils.	There are 4 located in the CNDDDB search. Suitable habitat may exist within the project area.		SSC
Pallid bat	<i>Antrozous pallidus</i>	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting. Man-made roosts are also used.	There is 1 located in the CNDDDB search. Suitable habitat may exist within the project area.		SSC
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	Caves, tunnels, mines and bridges, most commonly near mesic sites.	There are 2 located in the CNDDDB search. Suitable habitat may exist within the project area.		SSC

Western red bat	<i>Lasiurus frantzii</i>	Roosting habitat includes forests and woodlands from sea level up through mixed conifer forests.	There is 1 located in the CNDDDB search. Suitable habitat may exist within the project area.		SSC
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Federal Listing: FT = Federally listed as Threatened, FE=Federally listed as Endangered
State Listing: SSC = Species of Special Concern, SFP = State Fully Protected, E= Endangered, T = Threatened.

Work Activities

Arundo and tamarisk treatments will occur between July 16 and November 30th, which is outside of the mammal breeding season. 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. A temporary loss of forage material may occur either during non-native plant control work or when trimming native vegetation in order to treat invasive plants. These temporary impacts are largely negated by the benefits of native vegetation restoration and increased riparian health that will result from the proposed project. This temporal negative effect is offset by the control of non-native species and the increase of native vegetation in the treated areas which creates long term beneficial effects.

Tree removal operations have some potential to impact bats if dead trees are being used for roosting, although tree roosting would not be preferred for pallid bat or Townsend’s big-eared bat. The most likely habitat for these species in the project area would be abandoned buildings or bridges.

There are some recent sightings of American badger in the project area, particularly in proximity to the tree removal area. The most likely potential impact to badgers would be disturbance of denning sites for tree removal activities.

Herbicide Analysis for 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.

Herbicide Analysis for Bats

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 imazapyr 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.

Species Descriptions and Potential Impacts

American Badger (*Taxidea taxus*): CDFW Species of Special Concern. Dry, open shrublands, forest, and grasslands with friable soils. Most abundant in drier, open stages of most habitats; uses underground dens. Resident in suitable habitat throughout the state. Use of equipment for mowing and/or tree removal could physically disturb badger dens and/or individuals, and presence of equipment and crews in the area could provide aural disturbance if badgers are present.

Townsend's Big-Eared Bat (*Corynorhinus townsendii*): State listed as a species of special concern. Can be found in a variety of habitats. Roosts in caves, mines, tunnels, and buildings, preferring sites with caves and cavernous features; also roosts in old-growth sycamore. Most common in mesic areas. Found in suitable habitats throughout California. Impacts are unlikely as this species primarily uses man-made structures to nest and roost, and large trees with adequate cavities are not abundant in the project area.

Pallid Bat (*Antrozous pallidus*): State listed as a species of special concern. Roosts in rocky

outcrops, cliffs, caves, mines, trees (including orchards), bridges, barns, porches, bat boxes, occupied and vacant buildings, and even on or near the ground. Forages over open grasslands, oak savanna grasslands, open pine forests, talus slopes, gravel roads, orchards, and vineyards. Habitat range includes all of California.

Project 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 project 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 project 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 utilized for night roosts. Impacts are unlikely as this species primarily uses man-made structures to nest and roost, and large trees with adequate cavities are not abundant in the project area. No caves or other geologic structures suitable for this species will be impacted by project work.

Western Red Bat (*Lasiurus frantzii*): State listed as a species of special concern. Roosts primarily in trees, often adjacent to streams, fields, or urban areas. Preferred roost sites are protected from above, open below, and situated above dark ground cover to minimize water loss. Nesting sites have the same qualifiers as roosting sites. This species prefers edge habitats with trees for roosting and open areas for foraging. The project area is adjacent to agricultural and grassland areas and provides suitable roosting and nesting habitat for this species. Individuals may be directly impacted during hazard tree removal if roosting or nesting; however, they are unlikely to be nesting in fire-killed trees as they prefer roosts with live canopy to provide protection from above. Mowing and the use of other equipment may disturb roosting or nesting bats in overhead canopy.

Impacts to American badger and bats are potentially significant. Incorporation of mitigation measure BIO-5 will reduce potential impacts to a less than significant level.

Mitigations for Mammals

BIO-5: Special Status Bats and American Badger

- a) **For arundo and tamarisk treatment:** Crews shall 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.
- b) **For mowing and tree removal:** Prior to the start of operations at a project site, the area within 100 feet of mowing areas or areas where trees planned for removal, and 50 feet of landings and skid trails will be searched for American Badger denning sites. If a potential site is located, presence will be assumed and the site will have a 100 foot no operations buffer OR occupancy of the site will be determined using camera surveys. If the site is determined to be unoccupied, operations may continue unrestricted.

- c) For tree removal operations, a tiered tree removal approach will be used to create disturbance and encourage bats to mobilize before the tree is removed. This approach where operationally feasible may include:
- i. Causing disturbance prior to felling trees which are suspected to contain bats and/or treating boles suspected to contain bats, e.g. clearing vegetation adjacent to trees suspected to contain bats the day prior to felling, leaving boles overnight between staging and chipping to provide time for egress.
 - ii. Any trees felled from November 1 through April 30 will be staged overnight prior to transport or treatment to allow hibernating bats to exit the tree.

7. Special Status Birds

Ten special status birds were evaluated for their potential to occur in the work area. Six of the special status birds may have suitable habitat in the project area. Two species have limited suitable habitat present in the project area. One species does not have suitable habitat within the project area and was not evaluated further.

Table 9: Special Status Birds

Avian			Listing		
Common Name	Scientific Name	Distribution in project area	Analysis Class	Federal	State
Tricolored blackbird	<i>Aegelaius tricolor</i>	There are 7 located in the CNDDDB search. Suitable habitat is present in project area.	Small		SSC, FP
Western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	There is 1 located in in the CNDDDB search. Suitable habitat is present in project area.	Small	FT	E
Yellow-breasted chat	<i>Icteria virens</i>	There is 1 located in CNDDDB search. Suitable habitat is present in project area.	Small		SSC
Bald eagle	<i>Haliaeetus leucocephalus</i>	There is 1 located in CNDDDB search. Suitable habitat is NOT present in project area.	Large, fish eating		FP
Grasshopper sparrow	<i>Ammodramus savannarum</i>	There is 1 located in the CNDDDB search. Limited suitable habitat is present in project area.	Small		SSC
Swainson's hawk	<i>Buteo swainsoni</i>	There are 218 located in the CNDDDB search. Primarily nest in a few species of trees, including oaks, cottonwoods, sycamores, or willows (Schlorff & Bloom 1983, CDFG 1994). These species of trees are found throughout the entire Project Area.	Large, carnivorous		ST

Northern harrier	<i>Circus cyaneus</i>	There is 1 located in the CNDDDB search. Suitable nesting habitat is NOT present in the Project Area, though roosting/foraging habitat may be present.	Large, carnivorous		SSC
White-tailed kite	<i>Elanus leucurus</i>	There are 7 located in the CNDDDB search. Suitable habitat is present in project area.	Small, carnivorous		FP
Burrowing owl	<i>Athene cunicularia</i>	There are 50 located in the CNDDDB search.	Small, carnivorous		SSC

Federal Listing: FT = Federally listed as Threatened, FE = Federally listed as Endangered

State Listing: SSC = Species of Special Concern, FP = State Fully Protected, E = Endangered, T = Threatened

Work Activities

Arundo and tamarisk removal and herbicide treatments will occur predominantly after most avian species have completed nesting and/or fledged their young (refer to Table 2). Avian pre-surveys are required prior to herbicide application, hand cutting, and chipping of invasive arundo and tamarisk if work is proposed between July 16th and August 15th. 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.

Mowing of invasive arundo and tamarisk stands will occur outside of the avian breeding season (refer to Table 2). A temporary loss of forage areas may occur either during non-native plant control work or when trimming native vegetation in order to treat target non-native invasive plants. This temporal negative effect is offset by the control of non-native species and the increase of native vegetation in the treated areas which creates long term beneficial effects.

Tree removal may occur year-round outside of saturated periods. Pre-work surveys are required per BIO-6.

Herbicide Analysis for Small Birds (<1 lb.)

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 when an exposure estimate involving the consumption of contaminated vegetation (40.5 mg a.e./kg) is 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 small birds.

Herbicide Analysis for Large Birds (>1 lb.)

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 when an exposure estimate involving the consumption of contaminated vegetation (40.5 mg a.e./kg) is 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 large birds.

Herbicide Analysis for 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 when an exposure estimate involving the consumption of contaminated vegetation (40.5 mg a.e./kg) is 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 carnivorous birds.

Herbicide Analysis for 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 when an exposure estimate involving the consumption of contaminated vegetation (40.5 mg a.e./kg) is 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 fish-eating birds.

Avian Groups: Species Descriptions and Potential Impacts

RAPTORS AND OWLS:

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

California Fully Protected: White-tailed kite (*Elanus leucurus*), 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*) and Burrowing owl (*Athene cunicularia*)

For the arundo and tamarisk treatments, special-status raptors and owls will not be nesting during the active work timeframe (refer to Table 2), thus avoiding disturbance. Work may occur from July 16 to August 15th if avian pre-surveys have occurred, with nest buffers used to protect resources. Birds 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. During the latter period of project implementation, two of these species (Swainson's hawk and bald 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 arundo for foraging or nesting, so the loss of that vegetation is not expected to negatively affect these species. Nesting may occur in large tamarisk stands where the plant has out-competed native vegetation, but work windows as outlined in Table 2 make disturbance of nests unlikely.

Tree removal treatments may occur during the nesting period for raptors. Mitigation BIO-6 will prevent a significant impact from occurring.

Active bird nests are protected under the Migratory Bird Treaty Act (MBTA) and Section 3503.5 of the California Fish and Wildlife Code (CDFWC), which prohibits their disturbance or destruction, with certain exceptions. The Project will not disturb active nests of any bird.

Bald eagle (*Haliaeetus leucocephalus*): The bald eagle is a fully protected species in California. Bald eagles typically nest in forested areas adjacent to large bodies of water, staying away from heavily developed areas when possible. Bald eagles are tolerant of human activity when feeding, and may congregate around fish processing plants, dumps, and below dams where fish concentrate. For perching and nesting, bald eagles prefer tall, mature coniferous or deciduous trees that afford a wide view of the surroundings. Nests are typically built near the trunk, high up in the tree but below the crown. In winter, bald eagles can also be seen in dry, open uplands if there is access to open water for fishing. Fish of many kinds constitute the centerpiece of the diet (common examples include salmon, herring, shad, and catfish), but a wide variety of foods may be consumed including birds, reptiles, amphibians, invertebrates such as crabs, and mammals including rabbits and muskrats.

White-tailed kite (*Elanus leucurus*): The white-tailed kite is a fully protected species in California. White-tailed kites nest in native (primarily willow, valley oak, cottonwood, and walnut) and some non-native trees and forage in grassland, seasonal wetland, and agricultural habitats. White-tailed kite is a resident species throughout central and coastal California (Stillwater Sciences, 2015). This species is found primarily in riparian corridors and prefers habitat with lowland grasslands, tree groves for perching and nesting, and open areas that support small mammals (Stillwater Sciences, 2015). This species has potential to occur within the Project Area.

Swainson's hawk (*Buteo swainsoni*): Federal and State listed as Threatened. It nests in mature native and nonnative trees and forages in grassland and agricultural habitats. Although it is a listed species, the Swainson's hawk is relatively common in Solano County and in the vicinity of the project site due to the availability of nest trees and the agricultural crop patterns that are compatible with Swainson's hawk foraging. Solano County has a dense nesting population of Swainson's hawk, and the densest nesting population reported within the range of the species. Swainson's hawk primarily nest in a few species of trees, including oaks, cottonwoods, sycamores, or willows (Schlorff & Bloom 1983, CDFG 1994). These species of trees are found throughout the entire Project Area. While not necessarily a riparian species, nesting trees associated with Swainson's hawk are found in riparian areas, usually associated with main river channels (Bloom 1980, Estep 1989). This species has been observed within the Project Area.

Northern harrier (*Circus cyaneus*): Species of Special Concern. This species occupies meadows, grasslands, rangelands, deserts, and wetlands from sea level to alpine meadow habitats throughout the Central Valley and the Sierra Nevada, though it is rarely found in wooded areas. It is a less common resident of the Central Valley and uses tall grasses and forbs for cover. This species nests on the ground in shrubs or brush, usually at the edges of marshes, grasslands, or river/lake edges. The Project Area does not constitute prime nesting habitat for this species.

NON-RAPTOR, MIGRATORY AND RESIDENTIAL BIRDS (PASSERINE):

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

California Endangered: Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)

California Species of Special Concern: Yellow-breasted chat (*Icteria virens*), grasshopper sparrow (*Ammodramus savannarum*), tri-colored blackbird (*Agelaius tricolor*)

These species will likely not be nesting during the arundo active work timeframe (field work August 15 to Nov 30, or as dictated by CDFW under the Program's Streambed Alteration Permit), thereby avoiding disturbance. Work may occur from July 16 to August 15th if avian pre-surveys have occurred, with nest buffers used to protect resources. 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 arundo or tamarisk foraging or nesting, 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.

Active bird nests are protected under the Migratory Bird Treaty Act (MBTA) and Section 3503.5 of the California Fish and Wildlife Code (CDFWC), which prohibits their disturbance or destruction, with certain exceptions.

Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*): Western yellow-billed cuckoo is federally threatened, and is state listed as endangered (CDFW, 2016). On August 15, 2014, USFWS proposed to designate critical habitat in California, which does not include areas along Ulatis Creek (Stillwater Sciences, 2015). The western yellow-billed cuckoo is presently a rare migrant in Solano County. Because individual western yellow-billed cuckoos have been documented within the Project Area, which overlaps with their historical range, this species has potential to occur, but is not expected to nest, within the Project Area.

Yellow-breasted chat (*Icteria virens*): An uncommon summer resident and migrant in coastal California and in foothills of the Sierra Nevada. Cover requires riparian thickets of willow and other brushy tangles near watercourses for cover. There is 1 occurrence that shows in the CNDDDB search; however, this species is not expected to nest within Project Area.

Grasshopper sparrow (*Ammodramus savannarum*): An uncommon and local, summer resident and breeder in foothills and lowlands west of the Cascade-Sierra Nevada crest from Mendocino and Trinity cos. south to San Diego Co. Occurs in dry, dense grasslands, especially those with a variety of grasses and tall forbs and scattered shrubs for singing perches. A thick cover of grass and forbs is essential for concealment. There is 1 occurrence that showed in the CNDDDB search, however it was not within the Project Area. Project activities would not occur in ideal Grasshopper sparrow habitat.

Tricolored blackbird (*Agelaius tricolor*): Tricolored blackbird is a state species of special concern that nests in colonies from several dozen to several thousand breeding pairs. They have three basic requirements for selecting their breeding colony sites: open accessible water; a protected nesting substrate, including either flooded or thorny/spiny vegetation; and a suitable foraging space

providing adequate insect prey within a few miles of the nesting colony (Meese et al., 2014). Nesting colonies are found in freshwater emergent marshes in willows, blackberry bramble, thistles, or nettles. Some of the largest recent colonies have been in silage and grain fields (Meese et al., 2014). This species is a year-round resident in California, where it is largely endemic. Nesting colonies of tricolored blackbirds are protected as a candidate species for listing under the CESA (CDFW, 2016). The large nesting colonies typically occur within protected stands of cattails, tules, blackberry brambles, or willows, and near open, accessible water (Beedy and Hamilton, 1997; Hamilton 2004). A total of 41 records are listed in CNDDDB, occurring primarily in lowlands surrounding the Sacramento River, but extending up to the foothills. There may be suitable nesting habitat in expansive marsh vegetation or large blackberry thickets along Ulatis Creek. There have been eight documented sightings of tricolored blackbird during surveys reported by Truan et al. (2010) from 1997 to 2010, though their surveys were not designed to detect tricolored blackbird in numbers. Tricolored blackbirds were observed at Los Rios Farms, Putah Creek Sinks, Mace Boulevard, and along Putah Creek Road east of Winters (Truan et al., 2010). However, no nesting colonies have been found within the riparian zone immediately adjacent to Ulatis Creek. Tri-colored blackbirds will likely not be nesting during the project active work period (field work August 16 to Nov 15, or as dictated by CDFW under the Program's Streambed Alteration Permit), thereby avoiding disturbance. Avian pre-surveys would be conducted in suitable habitat for any active work between July 16 and August 15th.

Impact: Impacts to listed raptors and non-Raptor birds are potentially significant. Incorporation of BIO-6 will reduce impacts to a less than significant level.

Mitigations for Special-Status Birds

BIO-6: Special Status Birds, or Non-listed Raptors

a) For tree removal operations and crossing construction:

- i. Trees planned for removal shall be assessed for nests prior to removal.
- ii. If tree removal is planned during the nesting bird season (March 1st – August 15th), a walking survey of all reasonably accessible areas of the treatment site and the immediate vicinity visible from the treatment site shall be conducted by a qualified individual no more than 72 hours before the start of work. This survey will include examination of suitable nesting trees for nests, whitewash, or any sighting/vocalization associated with nesting birds, including raptors.

b) For arundo and tamarisk treatments:

- i. Work shall adhere to the timeline outlined in Table 2.
- ii. Herbicide application, cutting and hauling of biomass, and chipping that occurs between July 16th and August 15th requires a pre-work avian survey as described in **item a-ii** above.

c) For all project activities:

- i. If an active nest of a special status bird or non-listed raptor is identified during a pre-work survey, a temporary, species-appropriate buffer will be established around the nest. Buffer location and size will be determined by a qualified biologist and will be sufficient to prevent disturbance of breeding and nesting activities. Buffers shall be clearly flagged or otherwise delineated on the ground. Treatment activities will be implemented outside of the buffer until it is determined that the nestlings have fledged OR the nest is determined to be failed/abandoned. Factors to be considered for determining buffer

- location will include: presence of natural buffers provided by vegetation or topography, nest height above ground, baseline levels of noise and human activity, species sensitivity, and expected treatment activities.
- ii. If an active nest or vocal individual of a special status bird or non-listed raptor exhibiting behavior associated with nesting is discovered during operations, the contractor shall promptly cease all vegetation-disturbing activities within 200 feet of the nest and notify the project manager immediately. Buffers shall be established as described above before work can commence.
 - iii. For those bird species not listed above that are protected by the Migratory Bird Treaty Act: if an active nest is encountered during the survey, a 50-foot no-activity buffer for mowing or a 25-foot buffer for hand removal shall be applied around the nest until the nestlings have fledged OR the nest is determined to be failed/abandoned.
 - iv. A qualified biologist will monitor an active raptor nest during treatment activities to identify signs of agitation, nest defense, or other behaviors that signal disturbance of the active nest is likely (e.g., standing up from a brooding position, flying off the nest). If breeding raptors show signs of nest disturbance, one of the other avoidance strategies (establish buffer, modify treatment or defer treatment) will be implemented or a pause in the treatment activity will occur until the disturbance behavior ceases.

8. Sensitive Habitats

The project 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 or cut stump treatments in order to minimize potential impacts to native riparian vegetation or wetlands. To prevent herbicide-related mortality of native woody riparian vegetation that is immediately adjacent to arundo and tamarisk, branches of native vegetation will be trimmed or moved aside prior to herbicide applications to avoid the effects of overspray. Mowing will only be implemented in larger stands of arundo and tamarisk where native woody vegetation has been largely out-competed, and impacts to native vegetation will be minimal. The project will benefit riparian systems by restoring flows, reducing fire risk and allowing native vegetation to establish in areas where arundo and tamarisk were removed.

The removal of hazard trees from riparian areas has the potential to impact sensitive riparian habitat. Tree removal may involve the crossing of wetted channels, the removal of large woody debris from stream channels, and impacts to native riparian vegetation from falling branches or boles during tree removal. Some native vegetation may need to be removed to provide access for equipment and personnel; however, native shrubs over 6 inches in diameter will not be cut.

Impact: Impacts to riparian habitats, sensitive natural communities, and wetlands will be reduced to a less than significant level through the implementation of mitigations listed under HAZ-1, HAZ-2, HYD-1, HYD-2, HYD-3 and HYD-4. Refer to Items I and J of the environmental checklist.

9. Wildlife Movement

The project will result in short-term disturbances in small areas and will not negatively affect wildlife movement. In many areas, overgrowth of arundo and tamarisk impedes wildlife movement. These areas will have enhanced function as wildlife corridors.

Impact: *No impact on wildlife movement is anticipated.*

10. Conservation Planning and Zoning

Solano County adopted a Habitat Conservation Plan and a Natural Community Conservation Plan in 2019, and Solano County has implemented a Habitat Conservation Plan for their water resources. This project does not conflict with either the Solano County HCP/NCCP or the Solano County HCP. This project will assist in achieving the goals of the Solano and Solano County HCP/NCCP by improving riparian habitat. This project will remove invasive plant species that reduce habitat suitability and resource availability for threatened or endangered wildlife.

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
E. Cultural Resources.				
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Discussion: Hand cutting and removal of aboveground biomass and herbicide treatment of non-native plants are unlikely to disturb soil or impact belowground resources. Revegetation activities may cause minor soil disturbance. Significant disturbance of soil will not occur- no grading, grubbing or other mechanized movement of soil will take place. Therefore, no mitigations are proposed for project activities involving hand cutting/removal of invasive species, revegetation, chemical treatment of invasive species, and maintenance (as defined in Section II-D, “Project Methods”). Invasive species removal may occur using tracked or wheeled mowers (as defined in section II-D.2., “Mechanical Treatment of Invasive Arundo and Tamarisk”), which disturb soils. For these areas, mitigation TCR-1 shall apply. Hazard tree removal, as defined in Section II-D.1 of this document, may involve the use of chainsaws, excavators, skid steers, or other tracked or wheeled equipment which may cause soil disturbance. In tree removal areas, mitigation TCR-2 shall apply. Mitigations TCR-3, TCR-4, and TCR-5 will apply to all project activities that involve the use of tracked or wheeled equipment.

Impact: *Incorporation of TCR-1 through TCR-5 below will reduce project impacts to a less than significant level.*

Mitigations for Cultural Resources

CR-1: For Areas Where Mowing of Invasives is Proposed:

Prior to implementation, a professional archaeologist shall complete an archeological records check and will survey the proposed treatment area and prepare an associated archaeological report. This survey report and any associated site records will be turned into the CHRIS information center and kept on file by SRCD as a confidential addendum to this MND. Any work activities near an identified site will be assessed by a qualified archaeologist prior to work activities occurring. The Tribal contact (when available) and the archaeologist will determine what invasive plant control methods may be used within the site, or if work cannot occur at the site.

CR-2: For Tree Removal Treatments:

- a) Prior to implementation, a professional archaeologist shall complete an archeological records check and will survey the proposed treatment area and prepare an associated archaeological report. This survey report and any associated site records will be turned into the CHRIS information center and kept on file by SRCD as a confidential addendum to this MND.
- b) All sites shall be flagged by an archaeologist with a buffer sufficient to protect above-ground resources.
- c) Tracked or wheeled equipment will be excluded from site boundaries except at existing roads and trails. Equipment may cross linear historic era features at existing crossings, or at pre-determined crossings dictated by the archaeologist or Registered Professional Forester.
- d) Trees shall be directionally felled away from sites wherever safe and feasible.
- e) Additional mitigations may be implemented as necessary in consultation with the Archaeologist and local Native American Tribes.

For All Treatments involving the use of tracked or wheeled equipment:

CR-3: Cultural Resource Sensitivity Training shall be completed by all workers prior to doing ground disturbing work.

CR-4: If any previously unevaluated cultural resources (i.e., burnt animal bone, midden soils, projectile points or other lithics, historical artifacts, etc.) are encountered, work will be stopped, and a qualified archaeologist will assess the discovery and recommend/implement mitigation measures as necessary. Notification of findings to the Tribal contact will occur.

CR-5: If any human remains are encountered during any phase of work, work shall stop within 500 feet of the find. The county coroner shall be contacted to determine whether investigation of the cause of death is required as well as to determine whether the remains may be Native American in origin. Should Native American remains be discovered, the county coroner must contact the Native American Heritage Commission (NAHC). The NAHC will then determine those persons it believes to be most likely descended from the deceased Native American(s). Together with representatives of the people of most likely descent, a qualified archaeologist shall assess the discovered and recommend/implement mitigation measures as necessary. In coordination and agreement with landowners, the Tribe will have the final determination as to the disposition and treatment of human remains and grave goods.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
F. Energy.				
Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The project uses standard industry restoration equipment maintained and operated to meet and exceed legal standards. Work activities do not conflict with local plans. Impacts related to energy use are below a level of significance.

Impacts: *The project will have no impact on energy. No mitigation proposed.*

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
G. Geology and Soils.				
Would the project:				
a) Directly or indirectly cause 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 Division of Mines and Geology Special Publication 42).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii.) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii.) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv.) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

- d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?
- e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?
- f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Discussion: As proposed, the project will not result in hazardous conditions or exacerbate current conditions related to earthquake or ground rupture. Reduction and/or removal of arundo and tamarisk will improve flow conveyance reducing flooding and erosion. Areas with active bank erosion exist on some creeks and will require bank stabilization BMPs and revegetation at the culmination of the project. Arundo has weak root structure (consists of rhizomes), offering poor long-term bank protection. It is anticipated that deeply rooted native riparian plants will quickly reestablish themselves within the project area greatly reducing rates of sediment production and stream bank erosion. Removing non-native vegetation from riparian banks will occur aboveground only and will not negatively impact paleontological or geologic features below the surface.

Impacts: *Use of heavy equipment has potential to significantly impact soil erosion. Incorporation of GEO-1 will reduce potential impacts to a less-than-significant level.*

Mitigations for Geology and Soils

GEO-1: For project activities involving the use of heavy equipment, the following applies:

- a) Heavy equipment use shall not occur on an unstable area. Prior to treatment operations in an area over 30% slope; the treatment area will be traversed by a Registered Professional Forester or their supervised designee to identify any unstable areas requiring avoidance.
- b) Heavy equipment use shall be limited to the following slopes:

Table 10. Maximum slope limitations for tracked and wheeled equipment.

Equipment type	Maximum percent slope
Wheeled equipment	30%
Tracked Chippers	40%
Tracked equipment	50%
Walking Excavators	65%

- c) Heavy equipment operations may not occur during Saturated Soil conditions defined as follows: Soil and/or surface material pore spaces are filled with water to such an extent that runoff is likely to occur. Indicators of saturated soil conditions may include, but are not limited to: (1) areas of ponded water, (2) pumping of fines from the soil or road surfacing material during equipment

operations, (3) loss of bearing strength resulting in the deflection of soil or road surfaces under a load, such as the creation of wheel ruts, (4) spinning or churning of wheels or tracks that produces a wet slurry, or (5) inadequate traction without blading wet soil or surfacing materials.

- d) When heavy equipment is being utilized, equipment use must occur outside of periods where it has been continuously raining for more than 30 minutes.
- e) After rain ceases, the site will be allowed to dry for 24 hours before work resumes.
- f) Equipment and personnel shall use established roads, trails, and disturbed agricultural areas to enter work zones wherever possible. New equipment pathways into riparian zones shall be flagged by RPF or SRCD prior to operations.
- g) Trails created by equipment shall have waterbreaks installed per the standards below. Waterbreaks shall be installed prior to November 15th or when the National Weather Service forecasts at least a 30% chance of rain in the next 24 hours. Waterbreaks shall be cut diagonally at a minimum of six inches into mineral soil and may be installed by hand or with equipment.

Trail Gradient (%)	≤10	11-25	26-50	<50
Maximum Distance Between Waterbreaks (feet)	200	150	100	75

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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H. Greenhouse Gas Emissions.

Would the project:

- a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? Potentially Significant Impact Less Than Significant with Mitigation Incorporated Less Than Significant Impact No Impact
 - b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? Potentially Significant Impact Less Than Significant with Mitigation Incorporated Less Than Significant Impact No Impact
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Discussion: The only source of greenhouse gas emissions for this project will come from transportation and equipment use. Impacts related to greenhouse gas emissions are below a level of significance. The proposed project would generate greenhouse gas (GHG) emissions from: 1) the exhaust of vehicles used to transport crews, equipment, and materials; 2) powered hand tools (chainsaws) and sprayers; 3) chippers used to mulch biomass; and 4) tractors used to mow biomass. Reduced biomass of target non-native invasive species may also generate GHG emissions over time, through decomposition. The period of target non-native invasive treatment would be short-term and minor in nature. Furthermore, native riparian species that re-colonize the treatment sites will provide carbon sequestration services, require less management in the future, and be less susceptible to fire than arundo.

Impacts to Greenhouse gas emissions are less than significant. No mitigation measures are proposed.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. Hazards and Hazardous Materials.				
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project 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 project result in a safety hazard or excessive noise for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Discussion: The herbicides selected for this project (glyphosate, imazapyr, and triclopyr) pose insignificant risks to non-target wildlife and their habitats and to persons who may be in the project area during and after the application period.

This is due primarily to application methods being used (targeted, ground-based applications with hand-held equipment), the use of a certified applicator, the infrequent application (typically once per year), 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 project period is very low for glyphosate and triclopyr. Imazapyr has a greater risk of mobility, so the project will closely monitor the rate (volume of material per acre) to assure that overapplication does not occur.

This project would not require long-term storage, use, disposal or transport of hazardous material in

significant amounts. Only adequately trained and certified applicators will perform herbicide treatments. Daily herbicide treatment operations will be supervised by a California Department of Pesticide Regulation (DPR) Certified Applicator. Mixing herbicide only will only occur outside riparian areas at staging areas. 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, herbicide 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.

Fueled equipment used in riparian areas within the project area will be powered hand tools, ATVs which will transport personnel, chemicals and equipment to treatment areas, and mowing equipment.

Chippers, and tractors or trucks used to move the chipper, will only operate on pre-existing roads and access areas in riparian areas or in areas adjacent to the riparian zone. Chippers and tractors will not enter or cross standing or flowing water. Re-fueling vehicles, tractors and chippers will only occur outside of riparian areas. There is the possibility for gasoline to be spilled during refueling operations, but this is unlikely, and the risk of a spill would be low. Though unlikely, a fuel spill is potentially significant. Fuel and hydraulic lines on equipment could also breach, although this is also unlikely and the risk is low.

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 project area. The Project area does not lie within an airport land use plan. This Project 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 project activities could result in ignition of an accidental fire. This impact is potentially significant.

Impacts related to hazards and hazardous materials are potentially significant. Incorporation of the mitigation measures below will reduce potential impacts to a less-than-significant level.

Mitigations for Hazards and Hazardous Materials

HAZ-1: Equipment Maintenance, Fueling, and Mixing of Herbicides

All mixing of herbicides and fueling/maintenance of equipment, and storage of fuels/herbicides will occur only in non-vegetated areas adjacent to existing roads/landings and/or areas with compacted/disturbed soils. These areas shall not be located in areas where an accidental spill could result in entry of fuel, herbicide, or other hazardous materials into a wet or dry stream. No mixing of herbicides, equipment maintenance, or fueling of equipment shall be performed within 25 feet of stream channels or within sensitive habitat. Fuel shall not be transported across a flowing stream. Equipment shall be checked for leaks daily prior to the start of work. If equipment is found to be leaking during this check or at any time during the operation, it shall be moved to the nearest road, landing, or area with compacted/disturbed soils to be repaired on site or removed. Any contaminated soil resulting from an excessive spill from leaking equipment shall be removed. Spill kits shall be on site at refueling and maintenance areas. Herbicide applicators shall be responsible

for the immediate containment and removal of spilled material. CDFW shall be notified immediately if a spill occurs that could threaten a riparian area.

HAZ-2: Herbicide Application

- a) Herbicide applications will be conducted by trained staff and supervised by an applicator that holds a current California Qualified Applicator Certificate (QAC). Application shall comply with all applicable laws and regulations set by Solano County, the Department of Pesticide Regulation, or any other agency governing herbicide use.
- b) Herbicide treatments will not occur when the National Weather Service forecasts at least a 30% chance of rain in the next 24 hours
- c) Herbicide shall not exceed maximum rates dictated by the product label.
- d) Aquatic formulations of all herbicides, dyes, additives, and surfactants will be used.
- e) Dye shall be used in herbicide application to ensure adequate coverage and to monitor drift.
- f) Foliar spraying will not occur when ambient wind speeds exceed 10 miles per hour.
- g) Prior to treatment, arundo and tamarisk plants shall be physically separated from surrounding native vegetation to avoid application of herbicide to desirable species. Separation may be created by pushing, de-tangling, or trimming of vegetation. Native vegetation that is 6 inches DBH or greater shall not be trimmed.

HAZ-3: Fire Protection

During declared fire season, the following applies to all project activities:

- a) Operations requiring the use of a chainsaw or heavy equipment will be prohibited during red flag warning periods.
- b) During periods of the year when burn permits are required or burning is prohibited, a 3-hour walking fire patrol is required following chainsaw or heavy equipment use. During this period, operations shall cease when onsite relative humidity is less than 20%.
- c) The contractor will be required to have a sealed fire toolbox onsite, which includes one backpack pump-type fire extinguisher filled with water, two axes, two McLeod fire tools, and a number of shovels greater than or equal to the number of employees at the operation. The contractor will be required to carry a serviceable Underwriters Laboratories (UL) approved fire extinguisher containing a minimum 14 ounces of fire retardant with each operating power saw.
- d) When heavy equipment is used outside of existing roads, a tank truck or trailer, or 30 gallon or larger Compressed Air Foam System (CAFS) will be onsite. The tank truck or trailer must meet the following requirements:
 - i. Contain at least 300 gallons of water.

- ii. Include 300 feet of 3/4-inch inside diameter rubber-covered high-pressure hose mounted on live reel attached to pump with no segments longer than approximately 50 feet, when measured to the extreme ends of the couplings.
 - iii. Shall be capable of applying a minimum of 40 pounds pressure at the nozzle on 300 feet of hose.
 - iv. Shall be capable of being transported throughout the area proposed for treatment.
- e) If a CAFS system is used, it must meet the following requirements:
- i. Variable foam expansion ratio – 10:1 to 20:1.
 - ii. Units shall be kept fully charged with air/water and foam concentrate as recommended by the manufacturer and have the appropriate tools to service the system.
 - iii. The unit shall contain enough energy to empty tank and clear hose prior to exhausting propellant.
 - iv. The unit shall be capable of being completely recharged within 10 minutes.
- f) All heavy equipment shall be equipped with 1 shovel (> 46", sharp, handle smooth, size O or larger) 1 axe (> 28", > 2 1/2 lbs +, sharp, handle smooth) Two 4-A:60-B:C or larger fire extinguishers
- g) The SRCD project manager, Applicators, and all workers shall comply with all applicable fire safety standards as found in Public Resources Code Division 4, Chapter 6, (PRC's 4427, 4428, 4429, 4431, 4442, list not all inclusive).
- h) Vehicles shall not be parked in tall grass or any other location where heat from the exhaust system could ignite a fire.
- i) All motorized equipment shall have approved spark arrestors.
- j) A dependable radio or phone communication shall be available on site to report any emergency which may occur.
- k) 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, may have canes, limbs or other vegetative material cut and chipped, or disposed of in a legal manner.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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J. Hydrology and Water Quality.

Would the project:

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i.) result in a substantial erosion or siltation on- or off- site;	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii.) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii.) create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff; or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv.) impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The removal of downed woody material, arundo, and tamarisk from active portions of the stream corridor will expose soil predominantly within the floodplain and active channel, which may lead to short-term accelerated erosion rates until native vegetation gets established. However, the aerial extent and rate of this type of erosion will fall within the range of natural background levels. Conversely, the removal of dense stands of non-native vegetation and downed material within the stream corridor will reduce erosion potential on terrace banks, but not eliminate natural stream corridor migration. Stands of burned vegetation within the stream corridor that currently block and redirect floodwaters to adjacent terrace banks will be reduced, if not removed, resulting in more natural flows and stream course conditions. As a result of these improved flow conditions, the threat of terrace bank erosion, siltation of stream flows and flooding will be reduced. It is anticipated that through revegetation and maintenance efforts, deeply rooted native riparian plants will rapidly reestablish themselves within the project area reducing rates of sediment production and stream bank erosion. Although there may be a short-lived increase in erosion potential within the floodplain and active channel due to project actions, they will also result in more natural geomorphic processes (i.e., balanced erosion and deposition). When taken into consideration with the reduced erosion potential of terrace banks, the project will result in less than significant changes in erosion and/or deposition within the stream corridor. Groundwater supplies will be enhanced as control of

arundo and tamarisk will result in significant water savings. Arundo uses three to four times more water than replacement native vegetation.

Impacts to hydrology and water quality are potentially significant. Incorporation of the mitigation measures below will reduce impacts to a less-than-significant level.

Mitigations for Hydrology and Water Quality

HYD-1: Soil Stabilization

For tree removal areas and mowing areas:

Any bare areas created by tree removal operations and within 100 feet of a watercourse which supports fish or amphibian habitat, and which are larger than 400 contiguous square feet in area, shall be covered with wood chips to a depth of 2 inches with 80% coverage; or covered with seed-free straw mulch to a depth of 3 inches with 80% coverage. Mulching shall be completed immediately following operations OR no later than November 15th OR when the National Weather Service forecasts at least a 30% chance of rain in the next 24 hours

HYD-2: Equipment Staging

Equipment used during project activities, including tracked/wheeled equipment, vehicles, hand tools, chainsaws, etc., shall be staged outside of the riparian area on roads, turnouts, disturbed areas, or other non-vegetated locations. Equipment shall not be staged within 25 feet of the active stream channel.

HYD-3: Vegetation and Woody Debris Entering Stream Channel

- a) Trees shall be directionally felled away from stream channels wherever feasible.
- b) No cut woody material or mowed or mulched material shall be deposited in the active stream channel. Material that inadvertently falls in the stream channel shall be removed the same day it is deposited.
- c) Excess woody material that has fallen into the channel will be removed. Pre-fire existing large woody material in stream channels will be retained unless it is causing flow restriction. In this case, woody material shall be cut off at the bed or bank invert and removed with winch and cable or other equipment operated from the top of the bank.

HYD-4: Crossing of Stream Channels. NOTE: Activities noted below are subject to a forthcoming CDFW Lake and Streambed Alteration Permit. Conditions of the permit will take precedence over Mitigation Measure HYD-4.

- a) No activities shall permanently alter the flow, dewater or modify the stream channel. All diversions shall be temporary (see item d below).
- b) Temporary crossings in fish-bearing streams shall be designed to accommodate fish passage.
- c) Crossings shall be pre-determined and flagged by the RPF (for tree removal

operations or arundo/tamarisk removal) or by SRCD staff (for arundo/tamarisk removal) and shall be constructed only where necessary.

- d) Streamflow shall be diverted during crossing construction and use. Diversion may be done with temporary culverts, flex piping, etc. Refer to specifications of the Lake and Streambed Alteration Permit.
- e) Crossings shall be temporary and shall be removed prior to November 15th in any given year. No permanent crossings shall be constructed for the proposed project. Upon removal, crossings shall be hydrologically disconnected using waterbars, mulch, etc.
- f) Low water crossings shall:
 - i. Be constructed using temporary culverts topped by clean rock or gravels. No new soil or fine sediment shall be introduced into the channel or flood plain, OR
 - ii. Consist of a crane mat placed on top of wetted soils or low flows.
- g) Temporary crossings may not be constructed or used between November 15th and May 1st of each year.
- h) Existing crossings shall be utilized wherever possible.
- i) Prior to construction of temporary stream crossings, surveys shall be conducted as dictated by BIO-1, BIO-2, BIO-3(b), BIO-4(c), and BIO-6(a).

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
K. Land Use Planning.				
Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The project work is control of scattered infestations of target non-native plants, and removal of dead trees in riparian zones in portions of Solano Counties where the major land uses consist of residential parcels, farming, ranching, commercial activities, open space and wildlife habitat. 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 planned conservation plans.

Impact: *Project will not have an impact on land use planning.*

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
L. Mineral Resources.				
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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

Impact: *Project will not have an impact on mineral resources.*

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
M. Noise.				
Would the project:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Generation of excessive ground borne vibration or ground borne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) For a project located within the vicinity of a private airstrip or 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 project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: There will be minimal noise produced while implementing this project from heavy equipment and machinery used at work sites. Noise will be intermittent and temporary. Equipment to be used within the Project area will be vehicles to transport crews to work sites, chainsaws, chippers and 4-wheel ATV's or quads used for transportation. Chippers, quads, and chainsaws are

commonly used on the properties within the Project area, so use of this equipment during Project implementation is considered within the range of the ambient noise levels created in the area. Chainsaws, excavator equipment and skid steers will generate temporary elevated noise during tree removal. Tree removal only occurs once at any given site. Tree removal will cause some vibration and noise, but this will be temporary and minor. Noise levels will not be elevated near any airstrips. All equipment will be fitted with appropriate mufflers. Equipment will only be operated during daylight hours and only in a particular area for a brief period of time. Once project work has been completed within a portion of the Project area, noise levels will return to ambient levels.

Impact: Project will not have a significant impact on Noise.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
N. Population and Housing.				
Would the project:				
a) Induce substantial unplanned 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)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The Project area is within rural and urban portions of Solano Counties which have been zoned for farming, ranching, commercial, and residential development. Project work will occur within or immediately adjacent to riparian areas and will not impact development or population growth within the vicinity of the Project area. No population displacement will occur.

Impact: Project will not have an impact on Population and Housing.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
O. Public Services.				
Would the project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion: The project activities are in undeveloped riparian habitat and no construction is involved. There are no negative impacts to public services or facilities used to provide services. It is anticipated that project 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: *Project will not have an impact on Public Services.*

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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P. Recreation.

Would the project:

a) Would the project 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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

Impact: *Project will not have an impact on Recreation.*

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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Q. Transportation.

Will the Project:

a) Conflict with a project, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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R. Tribal Cultural Resources.

Would the project:

a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is::

i.) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii.) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Discussion: Hand cutting and removal of aboveground biomass and herbicide treatment of non-native plants are unlikely to disturb soil or impact belowground resources. Revegetation activities may cause minor soil disturbance. Significant disturbance of soil will not occur- no grading, grubbing or other mechanized movement of soil will take place. Therefore, no mitigations are proposed for project activities involving hand cutting/removal of invasive species, revegetation, chemical treatment of invasive species, and maintenance (as defined in Section II-D, “Project Methods”). Invasive species removal may occur using tracked or wheeled mowers (as defined in

Section II-D.2., “Mechanical Treatment of Invasive Arundo and Tamarisk)”, which disturb soils. For these areas, mitigation TCR-1 shall apply. Hazard tree removal, as defined in Section II-D.1 of this document, may involve the use of chainsaws, excavators, skid steers, or other tracked or wheeled equipment which may cause soil disturbance. In tree removal areas, mitigation TCR-2 shall apply. Mitigations TCR-3, TCR-4, and TCR-5 will apply to all project activities that involve the use of tracked or wheeled equipment.

Impact: Incorporation of TCR-1 through TCR-5 below will reduce project impacts to a less than significant level.

Mitigations for Tribal Cultural Resources

TCR-1: For Areas Where Mowing of Invasives is Proposed:

Prior to implementation, a professional archaeologist shall complete an archeological records check and will survey the proposed treatment area and prepare an associated archaeological report. This survey report and any associated site records will be turned into the CHRIS information center and kept on file by SRCD as a confidential addendum to this MND. Any work activities near an identified site will be assessed by a qualified archaeologist prior to work activities occurring. The Tribal contact (when available) and the archaeologist will determine what invasive plant control methods may be used within the site, or if work cannot occur at the site.

TCR-2: For Tree Removal Treatments:

- f) Prior to implementation, a professional archaeologist shall complete an archeological records check and will survey the proposed treatment area and prepare an associated archaeological report. This survey report and any associated site records will be turned into the CHRIS information center and kept on file by SRCD as a confidential addendum to this MND.
- g) All sites shall be flagged by an archaeologist with a buffer sufficient to protect above-ground resources.
- h) Tracked or wheeled equipment will be excluded from site boundaries except at existing roads and trails. Equipment may cross linear historic era features at existing crossings, or at pre-determined crossings dictated by the archaeologist or Registered Professional Forester.
- i) Trees shall be directionally felled away from sites wherever safe and feasible.
- j) Additional mitigations may be implemented as necessary in consultation with the Archaeologist and local Native American Tribes.

For All Treatments involving the use of tracked or wheeled equipment:

TCR-3: Cultural Resource Sensitivity Training shall be completed by all workers prior to doing ground disturbing work.

TCR-4: If any previously unevaluated cultural resources (i.e., burnt animal bone, midden soils, projectile points or other lithics, historical artifacts, etc.) are encountered, work will be stopped, and a qualified archaeologist will assess the discovery and recommend/implement mitigation measures as necessary. Notification of findings to the Tribal contact will occur.

TCR-5: If any human remains are encountered during any phase of work, work shall stop within

500 feet of the find. The county coroner shall be contacted to determine whether investigation of the cause of death is required as well as to determine whether the remains may be Native American in origin. Should Native American remains be discovered, the county coroner must contact the Native American Heritage Commission (NAHC). The NAHC will then determine those persons it believes to be most likely descended from the deceased Native American(s). Together with representatives of the people of most likely descent, a qualified archaeologist shall assess the discovered and recommend/implement mitigation measures as necessary. In coordination and agreement with landowners, the Tribe will have the final determination as to the disposition and treatment of human remains and grave goods.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
S. Utilities and Service Systems.				
Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a determination by the waste water treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion: The project 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 either be treated and left on site (scattered patches) or cut and chipped (spread in footprint of stand or disturbed area). If there is not sufficient appropriate space on the project site (a rare occurrence in arundo management projects), chipped material may be transported to landfills where it will not substantially impact land fill

space. Cut vegetative material will be removed from the stream channel and may be chipped and spread on site in consultation with landowners and using Solano 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: Project will have a less than significant impact on Utilities and Service Systems.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
T. Wildfire.				
Would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion: The project will control non-native target species, such as arundo, and remove hazardous, burned tree and vegetation material in riparian areas. Arundo is highly flammable, and its reduction will significantly reduce fire risk. No roads or infrastructure will be built, and no wildfire emergency response or evacuation plans will be impacted. Downstream flooding risk should be reduced as flow capacity will be enhanced/restored by reducing biomass. The targeted activities aim to increase water quality, restore hydrologic connectivity in the burned areas, and reduce wildfire and flood risk with the removal of noxious vegetation and restore banks and channels with native vegetation.

Refer to Mitigation Measure HAZ-3 for measures that will be taken to reduce wildfire hazard during project operations.

Impact: Project will have a less than significant impact to Wildfire.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
U. Mandatory Findings of Significance.				
Would the project:				
a) Does the project 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, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Does the project 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 projects.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Discussion:

a. ***Effects on environmental quality, fish or wildlife, and historic resources – Less than significant with mitigation incorporated***

Please refer to the analyses presented in the Environmental Checklist Items, particularly Item D – Biological Resources. While the proposed project has the potential to significantly impact various items on the checklist, mitigations have been incorporated and are summarized in Appendix A – Mitigation, Monitoring and Reporting Plan. Overall, removal of invasive species and fire-killed trees in riparian areas of the LNU Complex will improve watershed health, habitat, and safety in the highly degraded post-fire Ulatis and Putah Creek watersheds. Impacts would be reduced to **less than significant with mitigation incorporated**.

b. ***Cumulative Impacts – less than significant with mitigation incorporated.***

A cumulative impact refers to the combined effect of “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts” (CEQA Guidelines Section 15355).

For the purposes of this cumulative impacts analysis, the geographic area considered includes the larger Ulatis and Putah Creek Watersheds in Solano and Yolo Counties. The Yolo County

Resource Conservation District is implementing a similar riparian invasive species removal project in the Putah Creek Watershed (Putah-Cache Arundo Eradication Project, SCH No. 2019089063). This project is located directly north of Putah Creek, and invasive species removal methods are the same as those proposed in this project analysis. The Solano County Water Agency (SCWA) is also implementing the Lower Putah Creek Restoration Project, which is an ongoing effort to enhance geomorphic and ecological function on 24.2 miles of Putah Creek between the Putah Diversion Dam and the Yolo Bypass Wildlife area. Project activities implemented by SCWA are focused on invasive plant removal and channel stabilization and reconfiguration. This project borders the proposed project along the northern edge (Putah Creek). The proposed project analyzed in this MND would augment the efforts of these two projects and improve habitat conditions in the Putah and Ulatis watersheds. Given the highly degraded nature of many of the riparian areas targeted in the proposed project, cumulative negative impacts are not anticipated. Also, neither of the two existing projects include dead tree removal, so cumulative impacts are not anticipated. No other agency-coordinated efforts for dead tree removal are occurring on a watershed-scale.

County road maintenance and private land management operations are also occurring in the project vicinity. Within the Project areas, land use is largely rural and agricultural such as orchards and row crops. Agriculture is one of the main economic industries in Solano County, which produces approximately \$460 million annually in agricultural commodities (Solano County Crop and Livestock Report, 2023). Farming practices in the area usually include pesticide application to prevent crop loss from invasive weeds and pests. The herbicides used for this Project to remove arundo and other riparian non-native plants (glyphosate, imazapyr or triclopyr) are currently being used on agricultural land throughout Solano County. Although this Project will also be using these herbicides, it is anticipated that the amount of chemicals applied will be small and localized compared to the large-scale use on orchards and farms. From a cumulative effects perspective, the project is believed to be contributing an insignificant amount of herbicide exposure.

Importantly, the removal and control of non-native riparian plant species and the removal of fire-killed trees will improve the overall health, function 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 project, an array of Mitigation Measures have been developed that will reduce such impacts to below a level of significance level. In addition, Project work will only occur within a small portion of the Project area, along riparian corridors.

c. ***Effects on human beings – less than significant impact.***

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

Tree removal has the potential to impact workers during project implementation due to the risks associated with tree falling and heavy equipment use. Standard workplace protections and safety

programs will sufficiently protect workers from negative impacts associated with the proposed project. The environmental effects of the project are not anticipated to have a significant negative impact on human beings.

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APPENDIX A - Mitigation Monitoring and Reporting Plan

In accordance with CEQA Guidelines § 15074(d), when adopting a mitigated negative declaration, the lead agency will adopt a mitigation monitoring and reporting plan (MMRP) that ensures compliance with mitigation measures required for project approval. The Solano RCD is the lead agency for the above-listed project and has developed this MMRP as a part of the final IS-MND supporting the Project. This MMRP includes 1) Monitoring and reporting protocols adopted by the lead agency, and 2) Mitigation measures developed in the IS-MND that were designed to reduce environmental impacts to a less-than- significant level.

This MMRP also identifies the party responsible for implementing the measure, defines when the mitigation measure must be implemented, and which party or public agency is responsible for ensuring compliance with the measure. This form shall be kept on file by the Lead Agency and updated weekly during project implementation when operations are active.

1. Monitoring and Reporting Protocols:

Biological Monitoring: General biological monitoring shall be performed by an experienced general biologist, which may be SRCD staff or a consultant. The intent of biological monitoring is to ensure that crews are adhering to the stipulations of the MND and CDFW 1602 Permit. This type of monitoring typically occurs as a daily check-in, unless constant biological monitoring is required by one of the mitigation measures below.

Performance Monitoring: This type of monitoring shall be performed by SRCD staff and/or consultants and will occur annually to assess effectiveness of project treatments. Monitoring shall include site photos, quantitative data estimates for treatment success (percent control of invasives by cover and density, percent survivorship of native plantings, etc.), and a written report. Monitoring data will be used to determine when re-treatments and/or revegetation shall occur. Project work shall be considered successful if cover of invasive plants is less than 5% of the original invasive footprint by year 5. If site is maintained properly, by year 10, arundo and tamarisk cover should be less than 1%, with the goal of 100% control.

Permit-related reporting: Reporting shall be conducted to all regulatory agencies that issue a special permit for project-related work, in accordance with agency standards.

Salmonid Monitoring: The SRCD shall monitor and maintain a record of all interactions with salmon during project activities. Reporting information will include animal behavior, and any effects, location, and number observed. Project activities are scheduled to occur outside salmon presence in the system so interactions between project activities and salmon are unlikely.

2. Mitigation Measures:

The following is a list of the resources that will be potentially affected by the project and the mitigation measures made part of the Initial Study-Mitigated Negative Declaration.

MITIGATION MEASURES FOR BIOLOGICAL RESOURCES

Mitigation Measure BIO-1: Special Status Plants

- a. Focused surveys of suitable habitat shall be conducted by a qualified biologist prior to the start of work.

Surveys for **tree removal areas** shall focus on:

- g. *Fritillaria pluriflora*
- h. *Hesperolinon breweri*
- i. *Sidalcea keckii*
- j. *Viburnum ellipticum*
- k. *Delphinium recurvatum*
- l. *Trifolium amoenum*

Surveys for **arundo and tamarisk treatments** shall focus on:

- d. *Lasthenia conjugens*
- e. *Sidalcea keckii*
- f. *Trifolium amoenum*

Surveys for **crossing construction** shall focus on all of the above species.

- b. If one of the sensitive plant species listed above is detected during surveys, zones of 15 feet around the plant or outermost individual in a group of plants shall be flagged with “Special Treatment Zone” flagging.
- c. For **tree removal operations:**
- v. Tracked or wheeled equipment shall not be allowed to enter these zones except on existing roads and trails.
 - vi. Removal of trees may occur within these zones. Trees must be suspended out of the buffer zone without disturbing special-status plants; i.e., trees shall not be dragged over special-status plants, workers shall not trample special-status plants, etc.
 - vii. Chips or other woody material may not be broadcast into these special treatment zones.
 - viii. If a special-status plant species is detected during operations, all work will cease until the RPF is notified and appropriate buffer zones have been flagged as described above.
- d. For **arundo and tamarisk treatments:**
- i. Mowing shall not be allowed within plant protection zones as described in Item b above.
 - ii. Hand-cut material shall not be piled within zones described in Item b above. Invasive species may be hand-cut within zones and removed to an area outside the zone where they may be chipped, mowed, or left in place.
 - iii. Herbicide treatment within these zones shall be limited to targeted hand-spraying of glyphosate. Soil-active herbicides shall not be used.
 - iv. When spraying herbicide within plant protection zones, a 5-gallon bucket, shield, or other device shall be used to protect rare plants during application.
 - v. If a special-status plant species is detected during operations, all work will cease until the project manager is notified and appropriate buffer zones have been flagged as described above.

Schedule: Prior to operations

Responsible Party: Solano RCD Verification of Compliance [Initials and Date(s)]: _____ Monitoring Party: Solano RCD
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Mitigation Measure BIO-2: Valley Elderberry Longhorn Beetle

For all project operations:

- a) Project areas will be pre-checked for the presence of elderberry plants. Where present, individual elderberry plants with a stem diameter of 1 inch or greater or clumps of elderberry plants will be flagged for retention.
- b) 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.
- c) A qualified biologist will monitor the work area at appropriate intervals to assure that all avoidance and minimization measures are implemented.
- d) 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).
- e) The following protection measures shall be implemented within 20 feet of elderberry shrubs:
 - Target plants shall be hand cut. Invasive species less than 1 inch DBH may be pulled with a weed wrench only when doing so does not damage elderberry roots.
 - Mowing is not allowed within the 20-foot buffer.
 - Foliar spraying shall not occur. Only cut-stump applications are permitted.
 - Imazapyr or other soil-active herbicides will not be utilized.
- f) In addition to the restrictions outlined in Item 5 above, the following protection measures shall be implemented within the dripline of elderberry shrubs:
 - Mechanical weed removal within the dripline of the shrub will be done with hand tools rather than chainsaws, will be limited to the season when adults are not active (August - February) and will avoid damaging the elderberry.

Schedule: Prior to operations Responsible Party: Solano RCD Verification of Compliance [Initials and Date(s)]: _____ Monitoring Party: Solano RCD
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Mitigation Measure BIO-3: Foothill Yellow-Legged Frog and California Red Legged Frog:

- a) For tree removal and mowing of invasive arundo and tamarisk proposed between the first October or November rain amounting to more than ¼ inch and April 31st: prior to tree removal or large woody debris removal, a qualified biologist shall assess the work area via a visual survey to determine if suitable habitat is present. If so, a field survey will be conducted

to determine presence. If presence is detected, the occupied portion of the associated watercourse shall not be operated on during the above-mentioned seasonal restriction period, and any work must occur in the presence of a biological monitor.

- b) For all temporary crossing work: If suitable habitat for CARLF or FYLF is present at the location of the proposed crossing, surveys for California red legged frog and foothill yellow legged frog shall be conducted no more than 48 hours before crossing construction. Surveys shall be conducted by a qualified biologist and shall be tailored to the life stage of the frog for the period of construction. If special-status frogs are discovered during surveys, temporary crossing work at that location shall be placed on hold and CDFW shall be consulted per the requirements of relevant Lake and Streambed Alteration Permits.

Schedule: a) Prior to operations for tree removal and mowing, b) Prior to crossing work
Responsible Party: Solano RCD
Verification of Compliance [Initials and Date(s)]: _____
Monitoring Party: Solano RCD

Mitigation Measure BIO-4: Giant Garter Snake and Western Pond Turtle

- a) **For tree removal, mowing, hand cutting, and chipping:** Suitable habitat will be surveyed no more than 72 hours before start of work. Surveys will focus specifically on identifying burrows for giant garter snake and egg-laying sites for Western pond turtle, if seasonally applicable. If occupied sites are discovered during surveys, the following shall apply:
 - 4) Occupied habitat shall be treated after individuals have left the area as determined by a qualified biologist; OR
 - 5) Occupied habitat shall be given a 30-foot avoidance zone and work may proceed with a biological monitor on site; OR
 - 6) 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 Wildlife’s Lake and Streambed Alteration Agreement Program.
- b) **For herbicide application:** Pre-survey of suitable habitat is not required. Workers will be instructed to look out for wildlife and burrows and to avoid them while spraying.
- c) **For all temporary crossing work:** Surveys for Giant Garter Snake and Western Pond Turtle shall be conducted prior to crossing construction if suitable habitat exists. Surveys shall be conducted by a qualified biologist and shall be tailored to the life stage of the reptile for the period of construction. Surveys shall cover the crossing footprint and any suitable habitat within 30 feet of the crossing footprint. If giant garter snake or western pond turtle are discovered during surveys, temporary crossing work at that location shall be placed on hold and CDFW shall be consulted per the requirements of relevant Lake and Streambed Alteration Permits

Schedule: a) Prior to operations, b) During operations, c) Prior to crossing work
Responsible Party: Solano RCD
Verification of Compliance [Initials and Date(s)]: _____

Monitoring Party: Solano RCD

Mitigation Measure BIO-5: Special Status Bats and American Badger

- a) **For arundo and tamarisk treatment:** Crews shall 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.
- b) **For mowing and tree removal:** Prior to the start of operations at a project site, the area within 100 feet of mowing areas or areas where trees planned for removal, and 50 feet of landings and skid trails will be searched for American Badger denning sites. If a potential site is located, presence will be assumed and the site will have a 100 foot no operations buffer OR occupancy of the site will be determined using camera surveys. If the site is determined to be unoccupied, operations may continue unrestricted.
- c) For tree removal operations, a tiered tree removal approach will be used to create disturbance and encourage bats to mobilize before the tree is removed. This approach where operationally feasible may include:
 - i. Causing disturbance prior to felling trees which are suspected to contain bats and/or treating boles suspected to contain bats, e.g. clearing vegetation adjacent to trees suspected to contain bats the day prior to felling, leaving boles overnight between staging and chipping to provide time for egress.
 - ii. Any trees felled from November 1 through April 30 will be staged overnight prior to transport or treatment to allow hibernating bats to exit the tree.

Schedule: a) During operations. b) Prior to operations for mowing and tree removal; c) During operations, when feasible

Responsible Party: Solano RCD

Verification of Compliance [Initials and Date(s)]: _____

Monitoring Party: Solano RCD

Mitigation Measure BIO-6: Special Status Birds or Non-listed Raptors

- a) **For tree removal operations and crossing construction:**
 - i. Trees planned for removal shall be assessed for nests prior to removal.
 - ii. If tree removal is planned during the nesting bird season (March 1st – August 15th), a walking survey of all reasonably accessible areas of the treatment site and the immediate vicinity visible from the treatment site shall be conducted by a qualified individual within 72 hours of the start of work. This survey will include examination of suitable nesting trees for nests, whitewash, or any sighting/vocalization associated with nesting birds, including raptors.
- b) **For arundo and tamarisk treatments:**
 - i. Work shall adhere to the timeline outlined in Table 2.
 - ii. Herbicide application, cutting and hauling of biomass, and chipping that occurs between July 16th and August 15th requires a pre-work avian survey as described in **item a-ii** above.
- c) **For all project activities:**

- i. If an active nest of a special status bird or non-listed raptor is identified during a pre-work survey, a temporary, species-appropriate buffer will be established around the nest. Buffer location and size will be determined by a qualified biologist and will be sufficient to prevent disturbance of breeding and nesting activities. Buffers shall be clearly flagged or otherwise delineated on the ground. Treatment activities will be implemented outside of the buffer until it is determined that the nestlings have fledged OR the nest is determined to be failed/abandoned. Factors to be considered for determining buffer location will include: presence of natural buffers provided by vegetation or topography, nest height above ground, baseline levels of noise and human activity, species sensitivity, and expected treatment activities.
- ii. If an active nest or vocal individual of a special status bird or non-listed raptor exhibiting behavior associated with nesting is discovered during operations, the contractor shall promptly cease all vegetation-disturbing activities within 200 feet of the nest and notify the project manager immediately. Buffers shall be established as described above before work can commence.
- iii. For those bird species not listed above that are protected by the Migratory Bird Treaty Act: if an active nest is encountered during the survey, a 50-foot no-activity buffer for mowing or a 25-foot buffer for hand removal shall be applied around the nest until the nestlings have fledged OR the nest is determined to be failed/abandoned.
- iv. A qualified biologist will monitor an active raptor nest during treatment activities to identify signs of agitation, nest defense, or other behaviors that signal disturbance of the active nest is likely (e.g., standing up from a brooding position, flying off the nest). If breeding raptors show signs of nest disturbance, one of the other avoidance strategies (establish buffer, modify treatment or defer treatment) will be implemented or a pause in the treatment activity will occur until the disturbance behavior ceases.

Schedule: a-i) Prior to tree removal; a-ii) Between March 1st and August 15th, must conduct within 72 hours of start of tree removal work; b-i) Refer to Table 2 for dates; b-ii) between July 16th and August 15th, must conduct within 72 hours of herbicide, hand cutting, and chipping; c-i) Prior to operations; c-ii) During operations, c-iii) Prior to or during operations; c-iv) During operations
Responsible Party: Solano RCD
Verification of Compliance [Initials and Date(s)]: _____
Monitoring Party: Solano RCD

MITIGATIONS FOR CULTURAL RESOURCES

Mitigation Measure CR-1: For Areas Where Mowing of Invasives is Proposed:

Prior to implementation, a professional archaeologist shall complete an archeological records check and will survey the proposed treatment area and prepare an associated archaeological report. This survey report and any associated site records will be turned into the CHRIS information center and kept on file by SRCD as a confidential addendum to this MND. Any work activities near an identified site will be assessed by a qualified archaeologist prior to work activities occurring. The Tribal contact (when available) and the archaeologist will determine what invasive plant control methods may be used within the site, or if work cannot occur at the site.

Schedule: Prior to mowing operations
Responsible Party: Solano RCD

Verification of Compliance [Initials and Date(s)]: _____
Monitoring Party: Solano RCD

Mitigation Measure CR-2: For Tree Removal Treatments:

- a) Prior to implementation, a professional archaeologist shall complete an archeological records check and will survey the proposed treatment area and prepare an associated archaeological report. This survey report and any associated site records will be turned into the CHRIS information center and kept on file by SRCD as a confidential addendum to this MND.
- b) All sites shall be flagged by an archaeologist with a buffer sufficient to protect above-ground resources.
- c) Tracked or wheeled equipment will be excluded from site boundaries except at existing roads and trails. Equipment may cross linear historic era features at existing crossings, or at pre-determined crossings dictated by the archaeologist or Registered Professional Forester.
- d) Trees shall be directionally felled away from sites wherever safe and feasible.
- e) Additional mitigations may be implemented as necessary in consultation with the Archaeologist and local Native American Tribes.

Schedule: a) Prior to tree removal operations; b) Prior to tree removal operations; c) During tree removal operations; d) During tree removal operations
Responsible Party: Solano RCD
Verification of Compliance [Initials and Date(s)]: _____
Monitoring Party: Solano RCD

For All Treatments involving the use of tracked or wheeled equipment:

Mitigation Measure CR-3: Cultural Resource Sensitivity Training shall be completed by all workers prior to doing ground disturbing work.

Schedule: Prior to start of ground disturbing work
Responsible Party: Solano RCD
Verification of Compliance [Initials and Date(s)]: _____
Monitoring Party: Solano RCD

Mitigation Measure CR-4: If any previously unevaluated cultural resources (i.e., burnt animal bone, midden soils, projectile points or other lithics, historical artifacts, etc.) are encountered, work will be stopped, and a qualified archaeologist will assess the discovery and recommend/implement mitigation measures as necessary. Notification of findings to the Tribal contact will occur.

Schedule: During operations
Responsible Party: Solano RCD
Verification of Compliance [Initials and Date(s)]: _____
Monitoring Party: Solano RCD

Mitigation Measure CR-5: If any human remains are encountered during any phase of work, work shall stop within 500 feet of the find. The county coroner shall be contacted to determine whether investigation of the cause of death is required as well as to determine whether the remains may be Native American in origin. Should Native American remains be discovered, the county coroner must contact the Native American Heritage Commission (NAHC). The NAHC will then

determine those persons it believes to be most likely descended from the deceased Native American(s). Together with representatives of the people of most likely descent, a qualified archaeologist shall assess the discovered and recommend/implement mitigation measures as necessary. In coordination and agreement with landowners, the Tribe will have the final determination as to the disposition and treatment of human remains and grave goods.

Schedule: During operations
Responsible Party: Solano RCD
Verification of Compliance [Initials and Date(s)]: _____
Monitoring Party: Solano RCD

MITIGATIONS FOR GEOLOGY AND SOILS

Mitigation Measure GEO-1: For project activities involving the use of heavy equipment, the following applies:

- a) Heavy equipment use shall not occur on an unstable area. Prior to treatment operations in an area over 30% slope; the treatment area will be traversed by a Registered Professional Forester or their supervised designee to identify any unstable areas requiring avoidance.
- b) Heavy equipment use shall be limited to the following slopes:

Table 10. Maximum slope limitations for tracked and wheeled equipment.

Equipment type	Maximum percent slope
Wheeled equipment	30%
Tracked Chippers	40%
Tracked equipment	50%
Walking Excavators	65%

- c) Heavy equipment operations may not occur during Saturated Soil conditions defined as follows: Soil and/or surface material pore spaces are filled with water to such an extent that runoff is likely to occur. Indicators of saturated soil conditions may include, but are not limited to: (1) areas of ponded water, (2) pumping of fines from the soil or road surfacing material during equipment operations, (3) loss of bearing strength resulting in the deflection of soil or road surfaces under a load, such as the creation of wheel ruts, (4) spinning or churning of wheels or tracks that produces a wet slurry, or (5) inadequate traction without blading wet soil or surfacing materials.
- d) When heavy equipment is being utilized, equipment use must occur outside of periods where it has been continuously raining for more than 30 minutes.
- e) After rain ceases, the site will be allowed to dry for 24 hours before work resumes.
- f) Equipment and personnel shall use established roads, trails, and disturbed agricultural areas to enter work zones wherever possible. New equipment pathways into riparian zones shall be flagged by RPF or SRCD prior to operations.
- g) Trails created by equipment shall have waterbreaks installed per the standards below. Waterbreaks shall be installed prior to November 15th or when the National Weather Service forecasts at least

a 30% chance of rain in the next 24 hours. Waterbreaks shall be cut diagonally at a minimum of six inches into mineral soil and may be installed by hand or with equipment.

Trail Gradient (%)	≤10	11-25	26-50	<50
Maximum Distance Between Waterbreaks (feet)	200	150	100	75

Schedule: a) Prior to operations; b) During operations; c) During saturated soil conditions; d) During operations; e) During operations; f) During operations; g) Immediately following operations OR no later than November 15th OR when the National Weather Service forecasts at least a 30% chance of rain in the next 24 hours.
Responsible Party: Solano RCD
Verification of Compliance [Initials and Date(s)]: _____
Monitoring Party: Solano RCD

MITIGATIONS FOR HAZARDS AND HAZARDOUS MATERIALS

Mitigation Measure HAZ-1: Equipment Maintenance, Fueling, and Mixing of Herbicides

All mixing of herbicides and fueling/maintenance of equipment, and storage of fuels/herbicides will occur only in non-vegetated areas adjacent to existing roads/landings and/or areas with compacted/disturbed soils. These areas shall not be located in areas where an accidental spill could result in entry of fuel, herbicide, or other hazardous materials into a wet or dry stream. No mixing of herbicides, equipment maintenance, or fueling of equipment shall be performed within 25 feet of stream channels or within sensitive habitat. Fuel shall not be transported across a flowing stream. Equipment shall be checked for leaks daily prior to the start of work. If equipment is found to be leaking during this check or at any time during the operation, it shall be moved to the nearest road, landing, or area with compacted/disturbed soils to be repaired on site or removed. Any contaminated soil resulting from an excessive spill from leaking equipment shall be removed. Spill kits shall be on site at refueling and maintenance areas. Herbicide applicators shall be responsible for the immediate containment and removal of spilled material. CDFW shall be notified immediately if a spill occurs that could threaten a riparian area.

Schedule: During operations
Responsible Party: Solano RCD
Verification of Compliance [Initials and Date(s)]: _____
Monitoring Party: Solano RCD

Mitigation Measure HAZ-2: Herbicide Application

- a) Herbicide applications will be conducted by trained staff and supervised by an applicator that holds a current California Qualified Applicator Certificate (QAC). Application shall comply with all applicable laws and regulations set by Solano County, the Department of Pesticide Regulation, or any other agency governing herbicide use.
- b) Herbicide treatments will not occur when the National Weather Service forecasts at least a 30% chance of rain in the next 24 hours.

- c) Herbicide shall not exceed maximum rates dictated by the product label.
- d) Aquatic formulations of all herbicides, dyes, additives, and surfactants will be used.
- e) Dye shall be used in herbicide application to ensure adequate coverage and to monitor drift.
- f) Foliar spraying will not occur when ambient wind speeds exceed 10 miles per hour.
- g) Prior to treatment, arundo and tamarisk plants shall be physically separated from surrounding native vegetation to avoid application of herbicide to desirable species. Separation may be created by pushing, de-tangling, or trimming of vegetation. Native vegetation that is 6 inches DBH or greater shall not be trimmed.

Schedule: a, c, d, e, g) During operations; b) When the National Weather Service forecasts at least a 30% chance of rain in the next 24 hours; g) Prior to application of herbicide
Responsible Party: Solano RCD
Verification of Compliance [Initials and Date(s)]: _____
Monitoring Party: Solano RCD

Mitigation Measure HAZ-3: Fire Protection

During declared fire season, the following applies to all project activities:

- a) Operations requiring the use of a chainsaw or heavy equipment will be prohibited during red flag warning periods.
- b) During periods of the year when burn permits are required or burning is prohibited, a 3-hour walking fire patrol is required following chainsaw or heavy equipment use. During this period, operations shall cease when onsite relative humidity is less than 20%.
- c) The contractor will be required to have a sealed fire toolbox onsite, which includes one backpack pump-type fire extinguisher filled with water, two axes, two McLeod fire tools, and a number of shovels greater than or equal to the number of employees at the operation. The contractor will be required to carry a serviceable Underwriters Laboratories (UL) approved fire extinguisher containing a minimum 14 ounces of fire retardant with each operating power saw.
- d) When heavy equipment is used outside of existing roads, a tank truck or trailer, or 30 gallon or larger Compressed Air Foam System (CAFS) will be onsite. The tank truck or trailer must meet the following requirements:
 - i. Contain at least 300 gallons of water.
 - ii. Include 300 feet of 3/4-inch inside diameter rubber-covered high-pressure hose mounted on live reel attached to pump with no segments longer than approximately 50 feet, when measured to the extreme ends of the couplings.
 - iii. Shall be capable of applying a minimum of 40 pounds pressure at the nozzle on 300 feet of hose.
 - iv. Shall be capable of being transported throughout the area proposed for treatment.
- e) If a CAFS system is used, it must meet the following requirements:
 - i. Variable foam expansion ratio – 10:1 to 20:1.
 - ii. Units shall be kept fully charged with air/water and foam concentrate as recommended by the manufacturer and have the appropriate tools to service the system.

- iii. The unit shall contain enough energy to empty tank and clear hose prior to exhausting propellant.
- iv. The unit shall be capable of being completely recharged within 10 minutes.
- f) All heavy equipment shall be equipped with 1 shovel (> 46", sharp, handle smooth, size O or larger) 1 axe (> 28", > 2 1/2 lbs +, sharp, handle smooth) Two 4-A:60-B:C or larger fire extinguishers
- g) The SRCD project manager, Applicators, and all workers shall comply with all applicable fire safety standards as found in Public Resources Code Division 4, Chapter 6, (PRC's 4427, 4428, 4429, 4431, 4442, list not all inclusive).
- h) Vehicles shall not be parked in tall grass or any other location where heat from the exhaust system could ignite a fire.
- i) All motorized equipment shall have approved spark arrestors.
- j) A dependable radio or phone communication shall be available on site to report any emergency which may occur.
- k) 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, may have canes, limbs or other vegetative material cut and chipped, or disposed of in a legal manner.

Schedule: During declared fire season
Responsible Party: Solano RCD
Verification of Compliance [Initials and Date(s)]: _____
Monitoring Party: Solano RCD

MITIGATIONS FOR HYDROLOGY AND WATER QUALITY

Mitigation Measure HYD-1: Soil Stabilization

For tree removal areas and mowing areas, the following applies:

Any bare areas created by tree removal operations and within 100 feet of a watercourse which supports fish or amphibian habitat, and which are larger than 400 contiguous square feet in area, shall be covered with wood chips to a depth of 2 inches with 80% coverage; or covered with seed-free straw mulch to a depth of 3 inches with 80% coverage. Mulching shall be completed immediately following operations OR no later than November 15th OR when the National Weather Service forecasts at least a 30% chance of rain in the next 24 hours

Schedule: Immediately following operations OR no later than November 15th OR when the National Weather Service forecasts at least a 30% chance of rain in the next 24 hours
Responsible Party: Solano RCD
Verification of Compliance [Initials and Date(s)]: _____
Monitoring Party: Solano RCD

Mitigation Measure HYD-2: Equipment Staging

Equipment used during project activities, including tracked/wheeled equipment, vehicles, hand tools, chainsaws, etc., shall be staged outside of the riparian area on roads, turnouts, disturbed areas, or other non-vegetated locations. Equipment shall not be staged within 25 feet of the active stream channel.

Schedule: During operations
Responsible Party: Solano RCD
Verification of Compliance [Initials and Date(s)]: _____
Monitoring Party: Solano RCD

Mitigation Measure HYD-3: Vegetation and Woody Debris Entering Stream Channel

- a) Trees shall be directionally felled away from stream channels wherever feasible.
- b) No cut woody material or mowed or mulched material shall be deposited in the active stream channel. Material that inadvertently falls in the stream channel shall be removed the same day it is deposited.
- c) Excess woody material that has fallen into the channel will be removed. Pre-fire existing large woody material in stream channels will be retained unless it is causing flow restriction. In this case, woody material shall be cut off at the bed or bank invert and removed with winch and cable or other equipment operated from the top of the bank.

Schedule: During operations
Responsible Party: Solano RCD
Verification of Compliance [Initials and Date(s)]: _____
Monitoring Party: Solano RCD

Mitigation Measure HYD-4: Crossing of Stream Channels. **NOTE:** Activities noted below are subject to a forthcoming CDFW Lake and Streambed Alteration Permit. Conditions of the permit will take precedence over Mitigation Measure HYD-4.

- a) No activities shall permanently alter the flow, dewater or modify the stream channel. All diversions shall be temporary (see item d below).
- b) Temporary crossings in fish-bearing streams shall be designed to accommodate fish passage.
- c) Crossings shall be pre-determined and flagged by the RPF (for tree removal operations or arundo/tamarisk removal) or by SRCD staff (for arundo/tamarisk removal) and shall be constructed only where necessary.
- d) Streamflow shall be diverted during crossing construction and use. Diversion may be done with temporary culverts, flex piping, etc. Refer to specifications of the Lake and Streambed Alteration Permit.
- e) Crossings shall be temporary and shall be removed prior to November 15th in any given year. No permanent crossings shall be constructed for the proposed project. Upon removal, crossings shall be hydrologically disconnected using waterbars, mulch, etc.
- f) Low water crossings shall:
 - i. Be constructed using temporary culverts topped by clean rock or gravels. No new soil or fine sediment shall be introduced into the channel or flood plain, OR
 - ii. Consist of a crane mat placed on top of wetted soils or low flows.
- g) Temporary crossings may not be constructed or used between November 15th and May 1st of

each year.

- h) Existing crossings shall be utilized wherever possible.
- i) Prior to construction of temporary stream crossings, surveys shall be conducted as dictated by BIO-1, BIO-2, BIO-3(b), BIO-4(c), and BIO-6(a).

Schedule: a, b, d, f, h) During operations; c) Prior to crossing construction; e) Remove crossings before November 15th; g) No crossing installation between November 15th and May 1st; i) Prior to crossing construction

Responsible Party: Solano RCD

Verification of Compliance [Initials and Date(s)]: _____

Monitoring Party: Solano RCD

MITIGATIONS FOR TRIBAL CULTURAL RESOURCES

Mitigation Measure TCR-1: For Areas Where Mowing of Invasives is Proposed:

Prior to implementation, a professional archaeologist shall complete an archeological records check and will survey the proposed treatment area and prepare an associated archaeological report. This survey report and any associated site records will be turned into the CHRIS information center and kept on file by SRCD as a confidential addendum to this MND. Any work activities near an identified site will be assessed by a qualified archaeologist prior to work activities occurring. The Tribal contact (when available) and the archaeologist will determine what invasive plant control methods may be used within the site, or if work cannot occur at the site.

Schedule: Prior to mowing operations

Responsible Party: Solano RCD

Verification of Compliance [Initials and Date(s)]: _____

Monitoring Party: Solano RCD

Mitigation Measure TCR-2: For Tree Removal Treatments:

- a) Prior to implementation, a professional archaeologist shall complete an archeological records check and will survey the proposed treatment area and prepare an associated archaeological report. This survey report and any associated site records will be turned into the CHRIS information center and kept on file by SRCD as a confidential addendum to this MND.
- b) All sites shall be flagged by an archaeologist with a buffer sufficient to protect above-ground resources.
- c) Tracked or wheeled equipment will be excluded from site boundaries except at existing roads and trails. Equipment may cross linear historic era features at existing crossings, or at pre-determined crossings dictated by the archaeologist or Registered Professional Forester.
- d) Trees shall be directionally felled away from sites wherever safe and feasible.
- e) Additional mitigations may be implemented as necessary in consultation with the Archaeologist and local Native American Tribes.

Schedule: a) Prior to tree removal operations; b) Prior to tree removal operations; c) During tree removal operations; d) During tree removal operations

Responsible Party: Solano RCD

Verification of Compliance [Initials and Date(s)]: _____

Monitoring Party: Solano RCD

For All Treatments involving the use of tracked or wheeled equipment:

Mitigation Measure TCR-3: Cultural Resource Sensitivity Training shall be completed by all workers prior to doing ground disturbing work.

Schedule: Prior to start of ground disturbing work

Responsible Party: Solano RCD

Verification of Compliance [Initials and Date(s)]: _____

Monitoring Party: Solano RCD

Mitigation Measure TCR-4: If any previously unevaluated cultural resources (i.e., burnt animal bone, midden soils, projectile points or other lithics, historical artifacts, etc.) are encountered, work will be stopped, and a qualified archaeologist will assess the discovery and recommend/implement mitigation measures as necessary. Notification of findings to the Tribal contact will occur.

Schedule: During operations

Responsible Party: Solano RCD

Verification of Compliance [Initials and Date(s)]: _____

Monitoring Party: Solano RCD

Mitigation Measure TCR-5: If any human remains are encountered during any phase of work, work shall stop within 500 feet of the find. The county coroner shall be contacted to determine whether investigation of the cause of death is required as well as to determine whether the remains may be Native American in origin. Should Native American remains be discovered, the county coroner must contact the Native American Heritage Commission (NAHC). The NAHC will then determine those persons it believes to be most likely descended from the deceased Native American(s). Together with representatives of the people of most likely descent, a qualified archaeologist shall assess the discovered and recommend/implement mitigation measures as necessary. In coordination and agreement with landowners, the Tribe will have the final determination as to the disposition and treatment of human remains and grave goods.

Schedule: During operations

Responsible Party: Solano RCD

Verification of Compliance [Initials and Date(s)]: _____

Monitoring Party: Solano RCD