

**Initial Study
and Mitigated Negative Declaration**
for the
**Richvale Irrigation District Phase I Infrastructure Modernization
Project**
May 2020



Lead Agency:

Richvale Irrigation District
1193 Richvale Highway, Richvale, CA 95974

Prepared By:



111 Mission Ranch Blvd., Suite 100, Chico, CA 95926, Phone: 530.893.1600, Fax: 530.893.2113
info@NorthStarEng.com | www.NorthStarEng.com

Page Intentionally Left Blank.

Table of Contents

1 Project Contacts and Information..... 1

2 Project Description 2

3 Determination 10

4 Environmental Checklist..... 12

4.1 Aesthetics..... 12

4.2 Agricultural and Forestry Resources..... 14

4.3 Air Quality..... 16

4.4 Biological Resources..... 21

4.5 Cultural Resources 33

4.6 Energy..... 35

4.7 Geology and Soils..... 36

4.8 Greenhouse Gas Emissions..... 38

4.9 Hazards and Hazardous Materials..... 39

4.10 Hydrology and Water Quality..... 41

4.11 Land Use and Planning 43

4.12 Mineral Resources..... 43

4.13 Noise..... 44

4.14 Population and Housing..... 45

4.15 Public Services 45

4.16 Recreation..... 46

4.17 Traffic and Transportation 47

4.18 Tribal Cultural Resources..... 48

4.19 Utilities and Service Systems 49

4.20 Wildfire 50

5 Mandatory Findings of Significance..... 53

6 Preparers and References 54

6.1 Report Preparation and Review..... 54

6.2 References 54

7 Acronyms and Abbreviations..... 56

8 Mitigation Monitoring and Reporting Program..... 58

List of Tables

Table 1. Types of Improvements To be Implemented as Part of the Project..... 2

Table 2: Attainment Status for Criteria Air Pollutants for Butte County CA. 18

Table 3: Federally listed Species with Potential to Occur in the Action Area and Effect Determinations 23

Table 4: State listed Species with Potential to Occur in the Action Area and Associated Status..... 23

Table 5: Proposed Mitigation for Active and Inactive Season Work. 32

List of Figures

Figure 1: Location map..... 9

Figure 2: APE map..... 10

Appendices

- Appendix A: Biological Resources Assessment
- Appendix B: Giant Garter Snake Habitat Assessment
- Appendix C: Project Work Locations

1 Project Contacts and Information

This Project Information, Description, and Environmental Checklist contained herein constitute the contents of an Initial Study in accordance with Section 15063 of the California Environmental Quality Act (CEQA) Guidelines:

Project Title	Richvale Irrigation District Phase I Infrastructure Modification Project
Lead Agency Contact and Address	Richvale Irrigation District 1193 Richvale Highway Richvale, CA 95974
Project Sponsor's Name and Address	Richvale Irrigation District Sean Earley, General Manager (530) 882-4243
Contact Person and Phone Number	Sean Earley, General Manager Richvale Irrigation District (530) 882-4243 Mark Wolfe AICP, Principal Planner NorthStar (530) 893-1600 ext. 213

2 Project Description

The proposed project is part of Richvale Irrigation District’s (RID) comprehensive plan for system modernization and boundary flow monitoring developed as part of the 2014 Feather River Regional Agricultural Water Management Plan (FRRAWMP). The project will implement modernization improvements at 12 locations to reduce operational spillage and increase on-farm efficiency to provide multiple water use efficiency (WUE) benefits. The District has received implementation funding through the California Department of Water Resources (DWR) and the U.S. Bureau of Reclamation, and the proposed actions are expected to be completed by mid-2021. **(Figure 1-Location Map)**

Description of Construction Activities

Project activities will vary according to the needs of each specific location. These activities will include structural improvements at lateral canal headings along the Main Canal and Main West Canal to provide control of water level, flow, measurement and automation. Improvements will mostly consist of retrofitting of existing structures with new automated gates or the installation of weir boxes and Remote Tracker (RT) brackets. In addition, at some locations, improvements will include the construction of a concrete-lined section of the irrigation canal which will include buried conduit. Construction activities will vary according to the needs of each specific improvement location.

For purposes of this assessment, project activities were divided into eight separate improvement types, four of which would result in ground disturbing activities ranging in size from 2,020 square feet (sf) to 18,915 sq. A list of improvement types and if ground disturbance is required can be seen in **Table 1**.

Table 1. Types of Improvements To be Implemented as Part of the Project.

Site Name	Construction Activity	Ground Disturbance Required
Ollies Weir/Humpy West/Humpy Weir	Line section, bury conduit (105 ft), replace board bays with metal slide gates. Humpy West to be abandoned, boards removed.	Yes
Humpy South	Line section, bury conduit (270 ft)	Yes
Mixing Box	Line sections, actuated slide gate retrofit, replace 4 bays with slide gates and High Pump heading, bury conduit (470 ft)	Yes
Bradford Lateral	Weir box and RT bracket	Yes
Peterson Lateral	Weir box and RT bracket	Yes
Jones Weir	Actuated slide gate – retrofit	No

Site Name	Construction Activity	Ground Disturbance Required
Banyon Flume Resolution/Watts Heading	Replace board bays with metal slide gates and ITRC flap gate	No
9010 Weir	Replace board bays with metal slide gates	No
Rystrom Weir	Replace board bays with metal slide gates	No
Low Pump Heading and Drop Structure	New actuated radial gates	No
Floyd's Weir	Actuated slide gate – retrofit	No
Tower Weir	Actuated slide gate – retrofit	No

Activities that require ground disturbance and structural modification will consist of excavation trenching, concrete lining, new structure placement, and backfilling. Depending on the project type, construction activities will be completed with an excavator, skid steer-loader, skid-steer trencher, dump truck, concrete mix truck, concrete pump truck, a flatbed truck with a crane, and pickup trucks.

Typical excavation activities associated with the lining of canals, will consist of removing, re-contouring, and re-compacting earthen material along the canal banks to create a landform that will facilitate the lining of the section with concrete. Rock slope protection would be placed along the side slopes of transition points to protect the concrete lined portions from scour. Earthen material from excavations of the lined portions of canal may be temporarily stockpiled adjacent to the canal along the access road within the staging area. All work will be performed adjacent to the structure from the point of access.

Work areas vary depending on the improvement type and will include the improvement project, construction staging, and stockpile areas, if applicable. Construction staging will take place on the canal access roads adjacent to the improvement area. If equipment and construction materials are stored outside of the work area, they will be located within the District's maintenance yard and/or a construction easement would be obtained from adjacent landowners to utilize their existing agricultural operations yard. These yards are generally improved with gravel parking and outbuildings and are used for equipment storage, agricultural processing, vehicle maintenance, etc. All work areas will be clearly defined and marked to confine the areas of disturbance. In addition to the work areas, there are approximately 9.2 miles of access roads providing ingress and egress to the improvement sites. Since the project is occurring at discrete locations along longer portions of canal, it is important to differentiate between work areas and disturbance area. As such, the project areas include all the activities at each improvement site (i.e. staging, stockpiling, equipment movement, etc.) while the disturbance area is the where temporary and permanent ground disturbing activities will occur. It should be noted; the disturbance area is contained within the greater project area. See **Appendix C** for maps of project work locations.

Construction at each work location would be short in duration as the project mostly involves small replacements of water control structures such as weir boxes although lining canal sections may be longer in duration. Due to water delivery constraints during the irrigation season it is anticipated that some work may be necessary during the GGS inactive season, as this also coincides with a time when the District's canals are typically dry. However, when feasible, project construction will be conducted during the snake's active season (May-October). It is assumed that construction activities would likely occur concurrently at multiple locations. For activities involving retrofitting existing structures, the ease of construction and reduction in earthmoving activities has the potential to shorten the construction window for those types.

Construction is slated to begin in 2020. The schedule is influenced by inclement weather, timing of the execution of access agreements and permits, work windows and constraints that may be imposed by conditions defined in applicable permits. The project and construction activities are slated for completion in 2021. An extended timeframe may be required for construction completion dependent upon weather and permit requirements.

For construction activities anticipated to occur between October 1 through April 30 (GGS inactive season), any pre-construction activities that can occur, such as mechanical mowing, hand cutting, and site preparation, would be completed prior to September 15 of the year in which winter work is expected. Proposed avoidance and minimization measures that impact work scheduling are discussed in Avoidance and Minimization Measures

2.1 Environmental Setting

The Richvale Irrigation District Phase I Infrastructure Modernization Project is located in Butte County, within Township 19N, Range 02E of the Shippee, Biggs, West of Biggs, and Nelson U.S. Geological Survey (USGS) 7.5-minute quadrangles. More generally, RID is located in the northern Sacramento Valley, east of the Butte Creek and west of the Thermalito Afterbay within and surrounding the community of Richvale. The District's service area encompasses approximately 30,000 acres providing water primarily to agricultural customers. The District is bound on the north by the southern boundary of the Western Canal Water District, and on the south by the Cherokee Canal and the Biggs Extension Canal while the California Department of Fish and Wildlife's Upper Butte Basin Wildlife Area lies to the west. Adjoining water districts include Western Canal Water District to the north, Butte Water District to the east, and Biggs-West Gridley Water District to the south. The District is located in CALFED Subregion 5 and relies exclusively on surface water from the Bay-Delta watershed for its water supply. Landowners within the District also rely on groundwater to a limited extent, with increased reliance in years of severe drought and curtailment of surface water supplies from Lake Oroville.

The biological survey area (BSA) is that area within the District's service area where proposed improvements are located. Each improvement area includes the project area, the impact area, and the surrounding survey buffer. The environmental setting describes the BSA in its entirety.

The BSA is composed primarily of irrigation canals and rice fields, small areas of riparian habitat are found along the canals in the southern portion of the BSA. More urban and residential habitats are found within the central portion of the BSA within and surrounding Richvale. Vegetation observed within the District included species typical of urban and rural areas, pastures, rice, disturbed grasslands, riparian areas, and freshwater wetland habitats throughout the valley. The vegetation along the District's canals is dominated by non-native grasses and forbs along the top and upper portion of the canal banks and hydrophytic species along the lower portions near the water line and within the canal.

Non-native grass and forb species observed along the upper portions of District canal banks include johnsongrass (*Sorghum halepense*), crab grass (*Digitaria sanguinalis*), slender wild oat (*Avena barbata*), seashore vervain (*Verbena littoralis*), yellow star thistle (*Centaurea solstitialis*), field mustard (*Brassica rapa*), curly dock (*Rumex crispus*), horseweed (*Erigeron canadensis*), prickly lettuce (*Lactuca serriola*) and field bindweed (*Convolvulus arvensis*). The composition of species is heavily affected by mowing and herbicide applications conducted during routine canal maintenance of the access roads. Hydrophytic species encountered along the lower portions of the canal banks and within the canals include cattail (*Typha latifolia*), hardstem bulrush (*Schoenoplectus acutus*), water primrose (*Ludwigia hexapetala*), marsh purslane (*L. peploides*), mosquito fern (*Azolla filiculoides*), duckweed (*Lemna* sp.), and watergrass (*Echinochola crus-galli*).

The vegetation in the more urban portions of the district consists of ornamental tree species typical of residential landscaping including fruitless mulberry (*Morus alba*), Chinese pistache (*Pistacia chinensis*), palm (*Washingtonia* sp.), eucalyptus (*Eucalyptus* sp.), silver maple (*Acer saccharinum*), camphor (*Cinnamomum camphora*), cypress, and birch (*Betula* sp.). Ground cover consists of manicured landscaping including a variety of shrubs and herbaceous species and lawn.

Soils within the District generally consist of clay alluvium over loamy alluvium. A majority of the District is covered by four soil map units defined by the Natural Resources Conservation Service (NRCS), including Lofgren-Blavo Complex 0 to 1 percent slope, Esquon-Neerdobe Complex, 0 to 1 percent slopes, Duric Xerarents-East Biggs Complex 0 to 1 percent slope, and Esquon Silt Loam 0 to 1 percent slope. Topography is generally flat sloping to the southwest with elevations ranging from approximately 110 feet above mean sea level (msl) to approximately 60 feet above msl near the southwestern portion of the District. Weather within the District is typical of Mediterranean climates with hot, dry summers and mild winters with low to moderate rainfall amounts. Average rainfall is approximately 27 inches with a majority falling between November and March.

Habitat Types

California habitat types are described in the California Wildlife Habitat Relationships (CWHR) system based on classifications created by Mayer and Laudenslayer (1988). The CWHR system was designed to aid in the mapping of habitats utilized by California's commonly-occurring birds, mammals, reptiles, and amphibians.

The project area is composed primarily of irrigation canals and rice fields, small areas of riparian habitat are found along the Cherokee Canal. More urban and residential habitats are found within the central portion of the project area within and surrounding Richvale..

Barren

Barren habitat is defined by a lack of vegetation. Structure and composition of the substrate is often determined by the region of the state, the surrounding environment, and geologic conditions. Barren areas represent extreme environments for vegetation (i.e. impermeable substrate, vertical slope). Barren habitats are found in juxtaposition with a wide variety of habitat types throughout California. Where vegetation is absent the structure of the substrate becomes the primary component of the habitat.

Barren habitat is sporadically found throughout the District boundaries. It primarily occurs on pathways and access roads adjacent to the canals.

Urban

Urban habitat occurs throughout California from small villages to the largest metropolitan areas. The vegetative structure within urban habitats can be quite variable, but is often maintained. Species

composition can be dominated by exotic species but many times natives can be found as they can be better suited to the physical conditions of the region. Lawns are the typical groundcover found in urban habitats, they are comprised of a variety of grass species and are almost always irrigated. Urban habitat is present in the form of single-family residences throughout the BSA. The homes within the BSA are maintained and includes ornamental trees and shrubs plus a lawn. Species observed in urban habitat included European starling (*Sturnus vulgaris*) and house sparrow (*Passer domesticus*).

Urban habitat is primarily found within and surrounding Richvale as well as residential land uses located adjacent to agricultural land uses within the District.

Rice

Rice is found growing throughout the northern Central Valley typically on level terrain with heavy clay soils that hold water well. Rice is a flood irrigated annual crop grow in laser leveled fields that are flooded and then dried down to let the seed mature and to facilitate harvesting of the fields. Rice crops are typically planted in the spring and harvested in the fall months. Wildlife observed in this habitat included Brewer's blackbird (*Euphagus cyanocephalus*), red-winged blackbird (*Agelaius phoeniceus*), killdeer (*Charadrius vociferus*), and great blue heron (*Ardea herodias*).

This habitat type is found covering large areas of the District, primarily surrounding the community of Richvale.

Riverine

Riverine habitats consist of intermittent or perennial water. Higher elevation rivers and streams tend to be smaller and higher velocity. At lower elevations, rivers and streams become slow and enlarged. The transition from higher elevation to lower will cause temperature and turbidity to increase, dissolved oxygen will decrease and the bottom will transition from rocky towards muddy or silty. Riverine habitats are found in close association with terrestrial habitats and in many cases, are contiguous with lake and emergent wetland habitats.

Riverine habitat is present along Cherokee Canal at the southern border of the District, additionally, many of the canals throughout the District function similarly to riverine habitat. The canals are variable in width and depth but generally fall between 5 to 30 feet wide and anywhere from 1 to 10 or more feet deep. The canals are earthen lined for the most part and vegetated along the banks with primarily non-native species present. Some of the canals contain hydrophytic vegetation within the prism including cattail, bulrush, water primrose, mosquito fern, water grass, and smartweed.

Pasture

Pasture habitats are planted on flat and gently rolling terrain on soils not suitable for other crops and where an ample water supply is available (Mayer and Laudenslayer, 1988). Vegetation composition within pastures are a mix of perennial grasses and legumes that typically provide 100 percent canopy cover. The plant species seeded in pastures varies depending on management practices used and geographic area. Some typical plant species occurring in pastures includes Bermuda grass (*Cynodon dactylon*), dallisgrass (*Paspalum dilatatum*), rye grass (*Lolium* spp.), a variety of clovers (*Trifolium* sp.), and pacific rush (*Juncus effusus*). The height and density of the vegetation is dependent on cultural and management practices including the type of livestock and the duration of the grazing. Pastures can be utilized by a variety of wildlife including ground nesting birds such as waterfowl, pheasant, cranes, egrets, and killdeer. Pastures also provide foraging habitat for raptor species including northern harriers and white-tailed kites and mammal species including deer.

Pasture habitat is found sporadically to the west of Richvale as well in small portions at the periphery of the towns at rural residences.

Annual grassland

Annual grasslands are described as open grasslands composed primarily of annual plant species. Species commonly found within annual grasslands include wild oats (*Avena fatua*), ripgut brome (*Bromus diandrus*), red brome (*Bromus madritensis*), soft chess (*Bromus hordeaceus*), wild barely (*Hordeum spontaneum*), foxtail fescue (*Vulpia myuros*), filaree (*Erodium ssp.*), and various clovers (*Castilleja*) among others. Wildlife species that use annual grasslands include the western fence lizard (*Sceloporus occidentalis*), garter snake (*Thamnophis*), western rattlesnake (*Crotalus oreganus*), black-tailed jackrabbit (*Lepus californicus*), California ground squirrel (*Otospermophilus beecheyi*), burrowing owl (*Athene cunicularia*), short-eared owl (*Asio flammeus*), horned lark (*Eremophila alpestris*), western meadowlark (*Sturnella neglecta*), northern harrier (*Circus hudsonius*), and American kestrel (*Falco sparverius*).

Annual grassland habitats are found on the upper portions of most of the canals within the District. They tend to occur in narrow strips rather than large portions of contiguous land.

Fresh Emergent Wetland

Fresh emergent wetlands are found throughout California and typically occur in level to gently rolling terrain. Fresh emergent wetlands are flooded enough that plants present are able to prosper in anaerobic conditions. This habitat is dominated by emergent hydrophytes such as hardstem bulrush (*Schoenoplectus acutus*) and cattail (*Typha latifolia*). Typical wildlife observed in this habitat include great egret (*Ardea alba*), great blue heron, killdeer, red-winged blackbird, Brewer's blackbird, wood duck (*Aix sponsa*), mallard (*Anas platyrhynchos*), Sierran tree frog (*Pseudacris sierra*) and red swamp crayfish (*Procambarus clarkia*).

Fresh emergent wetland habitat is found within many of the canals within the District's boundaries.

Valley Foothill Riparian

Valley foothill riparian habitat generally is found in association with riverine systems in California. Structurally, valley foothill riparian habitats are quite diverse, containing distinct vegetation layers. Fremont cottonwood (*Populus fremontii*), interior live oak (*Quercus wislizeni*), and Goodding's black willow (*Salix gooddingii*) dominated the canopy of the valley foothill riparian habitats on the site. The understory was quite sparse but did contain mule's fat (*Baccharis salicifolia*). The herbaceous layer consisted mostly of non-native grasses.

The diversity of vegetative structure within valley foothill riparian habitats provides food, water, nesting, dispersal habitat, and shelter for a number of species. On the site Bullock's oriole (*Icterus bullockii*), western kingbird (*Tyrannus verticalis*), lesser goldfinch (*Spinus psaltria*), house finch (*Haemorhous mexicanus*), Bewick's wren (*Thryomanes bewickii*), tree swallow (*Tachycineta bicolor*), northern mockingbird (*Mimus polyglottus*), and western fence lizard (*Sceloporus occidentalis*) were all encountered in the valley foothill riparian patch within the BSA.

Valley foothill riparian habitat is found in very small portions primarily along the Cherokee canal east and south of Richvale.

NorthStar prepared a Biological Resources Assessment (BRA, **Appendix A**) which includes a list of special-status plants and wildlife species from information provided by the U.S. Fish and Wildlife Services (USFWS) species list, the California Department of Fish and Wildlife Natural Diversity Database (CNDDDB), and the California Native Plant Society (CNPS) species list. The information was evaluated to determine the likelihood of each species' occurrence in and near the project and the potential impacts from the proposed project (NorthStar, May 2019). Two special-status plant species were determined to have at least moderate potential to occur including Sanford's arrowhead (*Sagittaria sandordii*) and woolly rose-mallow (*Hibiscus lasiocarpus* var. *occidentalis*). The BSA potentially

provides suitable habitat for two special-status reptile species including giant garter snake (GGS) (*Thamnophis gigas*), and northwestern pond turtle (*Actinemys marmorata*). Northwestern pond turtle was observed by NorthStar biologist Matt Rogers within the District's canal adjacent to Colusa Highway. Giant garter snake was not observed during biological surveys but there are a number of known occurrences within the area with some overlapping with potential work areas. The BSA provides potentially suitable nesting habitat for a variety of birds including tricolored blackbird (*Agelaius tricolor*), greater sandhill crane (*Grus canadensis tabida*), loggerhead shrike (*Lanius ludovicianus*), merlin (*Falco columbarius*), northern harrier (*Circus hudsonius*), Osprey (*Pandion haliaetus*), Swainson's hawk (*Buteo swainsoni*). Additionally, the BSA provides suitable foraging and nesting habitat for variety of migratory birds protected by the Migratory Bird Treaty Act (MBTA) within the project boundaries

There is no potential for any special-status fish species to occur within the BSA due to a lack of suitable riverine habitat for listed salmonids. Additionally, water diversions are required to be screened to prevent passage of adult anadromous fish from natural water bodies with connectivity to the ocean into the canals.

Due to the potential for GGS, NorthStar prepared a Biological Assessment (BA) to initiate consultation with the USFWS to request concurrence that the proposed project may affect, and is likely to adversely affect the federally-listed as threatened GGS. The proposed project is not within designated or proposed critical habitat for any federally-listed species. The project will incorporate the Avoidance and Minimization Measures identified by regulatory agencies to avoid impacts to GGS (NorthStar, June 2019). No other federally listed special-status species are expected to occur in the project area.

The mean annual precipitation is approximately 20 inches per year. The mean annual air temperature during the summer is approximately 77°F, and approximately 48°F during the winter months. (WRCC 2018). The site is approximately 55 feet above sea level.

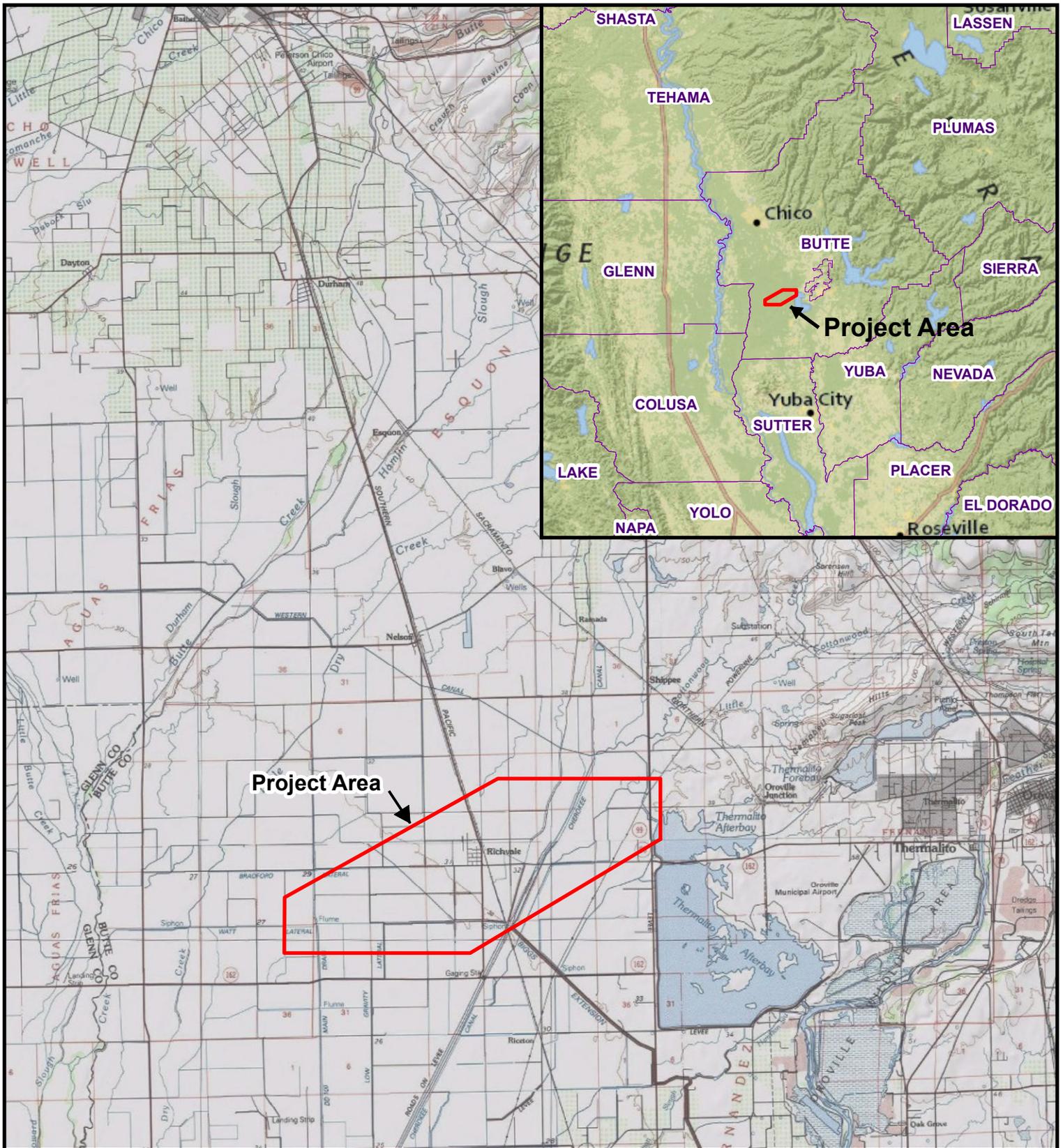
2.2 Other Public Agencies Whose Approval is Required/Obtained

United States Army Corps of Engineers

- USFWS Section 7 Endangered Species Act (ESA) Determination

California Department of Fish and Wildlife-Fish and Game Code

- Section 2080.1 Notification and Consistency Determination



Project Area

Project Area

Legend

 Project Location

0 6,250 12,500 25,000
 Feet

1 inch = 12,500 ft (printed at 8.5 x 11)

Imagery Source:
 USGS Topo
 Inset Imagery:
 National Geographic



Within Township 19N
 Range 02E,
 Butte County, CA
 Biggs, West of Biggs,
 Shippee, & Nelson
 USGS 7.5' Quads

Map Date:
 February 1, 2019

Drawn By:
 TDA

NSE Project #
 18-031

Figure 1: Location Map

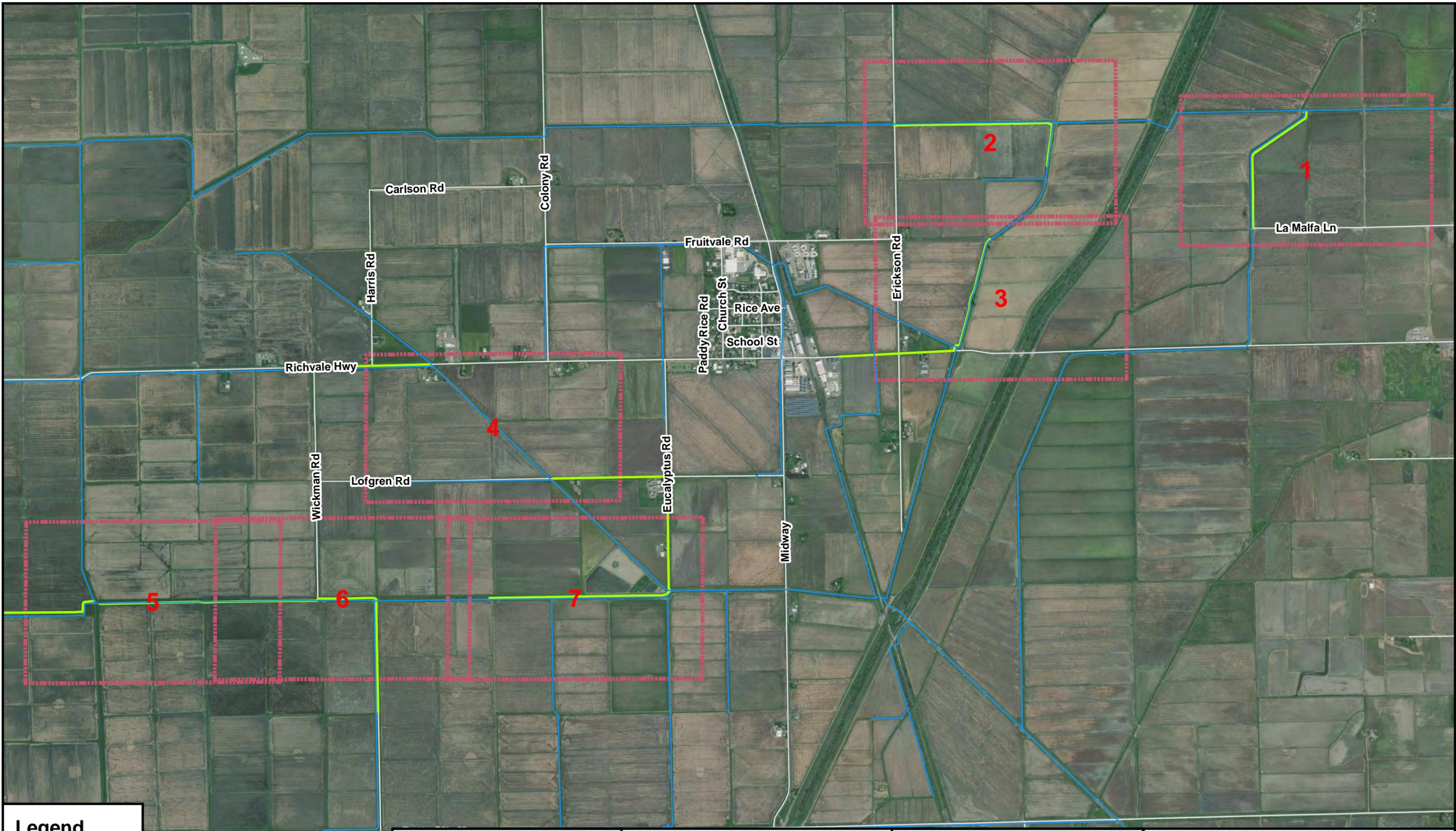
Richvale Irrigation District
 Irrigation Improvements - Butte County, CA



NORTHSTAR

... Designing Solutions

111 MISSION RANCH BLVD., SUITE 100 CHICO, CA 95926
 PHONE: (530) 893-1600 - www.NorthStarEng.com - © NorthStar



Legend

- AccessRoutes
- Roads
- Sheet No.
- Canals

0 1,050 2,100 4,200
 Feet

1 inch = 2,000 ft
 (printed at 11" x 17")

Sheet of 1

Within Township 19N, Range 02E, MDM
 Shippe, Biggs, West of Biggs, & Nelson USGS 7.5' Quad

Imagery Source:
 Google Earth 4/15/15 and ESRI USGS FSA

Original Map Date: January 24, 2019	NSE Project # 18-031	Drawn By: TA
--	-------------------------	-----------------

APE Index Map

Richvale Irrigation District
 Facilities Improvement Project
 - Butte County, CA -

NORTHSTAR

... Designing Solutions

111 MISSION RANCH BLVD., SUITE 100 CHICO, CA 95926
 PHONE: (530) 893-1600 - www.NorthStarEng.com - © NorthStar

3 Determination

3.1.1 Environmental Factors Potentially Affected

The environmental factors checked below could be potentially affected by this project; however, with the incorporation of mitigation measures,* potentially significant impacts are reduced to less than significant level by the project” (CEQA Guidelines Section 15382).

- | | | |
|--|--|--|
| <input type="checkbox"/> Aesthetics | <input type="checkbox"/> Agricultural/Forestry Resources | <input checked="" type="checkbox"/> Air Quality |
| <input checked="" type="checkbox"/> Biological Resources | <input checked="" type="checkbox"/> Cultural Resources | <input type="checkbox"/> Energy |
| <input type="checkbox"/> Geology/Soils | <input type="checkbox"/> Greenhouse Gas Emissions | <input type="checkbox"/> Hazards/Hazardous Materials |
| <input 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 | <input type="checkbox"/> Tribal Cultural Resources |
| <input type="checkbox"/> Utilities/Service Systems | <input type="checkbox"/> Wildfire | <input checked="" type="checkbox"/> Mandatory Findings of Significance |

3.1.2 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.

Matthew Rogers
Signature

5-6-20
Date

Matt Rogers, Associate Planner
Printed Name

Richvale Irrigation District
For

4 Environmental Checklist

4.1 Aesthetics

Would the project:	Potentially Significant	Less Than Significant with Mitigation	Less Than Significant	No Impact
a) Have a substantial adverse effect on a scenic vista?			X	
b) Substantially damage scenic resources within a state scenic highway?				X
c) Substantially degrade the existing visual character or quality of the site/surroundings?				X
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?				X

4.1.1 Setting

The Butte County General Plan Figures COS-7, COS-8, and COS-9 display identified scenic resources within Butte County. The scenic resources depicted in COS-7 include the land based scenic resources (Table Mountain, Butte Creek Canyon, Feather Falls Scenic Area, and Sacramento River Wildlife Refuge) and water based scenic resources (Lake Oroville, Lake Wyandotte, Thermalito Afterbay, and Philbrook Reservoir).

There are no officially designated State Scenic highways within Butte County, however, State Route 70 (SR 70) north of the intersection of State Route 149 (SR 149) is considered an eligible State Scenic Highway. As seen in Figure COS-8 in the Butte County General Plan the County has designated SR 70 through the Feather River Canyon and a portion of State Route 32 (SR 32) north of Forest Ranch as County Scenic Highways.

Scenic Highway Overlay Zones are identified in COS-9 of the General Plan, the zones extend 350 linear feet from the centerline of each of the scenic routes identified. The Scenic Overlay Zones can be found on portions of SR 32 north of Chico, the Skyway, southern portions of State Route 191 (SR 191) and Pentz Road, and portions along Forbestown Road and Lumpkin Road.

Based on information presented within the Butte County General Plan, the project area is not located within, or in the vicinity of any identified scenic resources.

4.1.2 Discussion

a) **Less than Significant.** The Butte County General Plan does not inventory any scenic vistas within the project area and there are no scenic vistas proximate to the project site. The General Plan Draft Environmental Impact Report (DEIR) identifies geographic features such as the Table Mountain, Butte Creek Canyon, Feather Falls Scenic Area, and the Sacramento River Wildlife Area as scenic resources within the County which contribute to the County's character. This project is not located near the Sacramento River or the Feather River. The project site is north of the Sutter Buttes, however it will not obstruct the views of the mountain range. Although the rural setting and unique geography of Butte County and its surrounding area have created a number of scenic vistas and corridors, the

proposed project only includes minor canal facilities replacement, along the existing canal alignments for improved efficiencies and will not have a substantial adverse effect on a scenic vista.

- b) **No Impact.** There are no resources within a state scenic highway in the project area. Furthermore, there are no officially recognized scenic roadways in Butte County. The proposed project would not result in a significant change to the appearance of the existing roadway, nor would it eliminate access to scenic views or alter the landscapes surrounding the project site.
- c) **No Impact.** The proposed project will not substantially degrade the existing visual character or quality of the site and its surroundings. The project would not create structures with a substantial vertical presence. Temporary visual impacts may occur during construction activities, when heavy equipment and construction materials will be present within the project area. Neither the function nor the general appearance of the surrounding area would be substantially modified by the proposed project.
- d) **No Impact.** The improvements associated with this project do not include the installation of lighting or reflective surfaces that could contribute to substantial sources of light or glare. Additionally, construction will not occur during the evening or nighttime hours.

Mitigation: None required

4.2 Agricultural and Forestry Resources

Would the project:	Potentially Significant	Less Than Significant with Mitigation	Less Than Significant	No Impact
a) Convert Farmland (Prime, Unique or of Statewide Importance) pursuant to the Farmland Mapping and Monitoring Program of the CA Resources Agency, to non-agricultural use?				X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 1220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				X
d) Result in the loss of forest land or conversion of forest land to non-forest use?				X
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?			X	

4.2.1 Setting

Important Farmland

To characterize the environmental baseline for agricultural resources, Important Farmland Maps produced by the California Department of Conservation's Farmland Mapping and Monitoring Program (FMMP) were reviewed. Important Farmland maps show categories of Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance (if adopted by the county), Grazing Land, Urban and Built-up Land, Other Land, and Water. Prime Farmland and Farmland of Statewide Importance map categories are based on qualifying soil types, as determined by the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), as well as current land use. These map categories are defined by the Department of Conservation's FMMP as follows:

Prime Farmland: Land which has the best combination of physical and chemical characteristics for the production of crops. It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops when treated and managed, including water management, according to current farming methods.

Farmland of Statewide Importance: Land that is similar to *Prime Farmland* but with minor shortcomings, such as greater slopes or less ability to hold and store moisture.

Unique Farmland: Land of lesser quality soils used for the production of specific high economic value crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to produce sustained high quality or high yields of a specific crop when treated and managed according to current farming methods. It is usually irrigated, but may include non-irrigated orchards or vineyards as found in some climatic zones in California. Examples of crops include oranges, olives, avocados, rice, grapes, and cut flowers.

Farmland of Local Importance: Land of importance to the local agricultural economy, as determined by each county's board of supervisors and local advisory committees. Examples include dairies, dryland farming, aquaculture, and uncultivated areas with soils qualifying for *Prime Farmland* and *Farmland of Statewide Importance*. Butte County has not adopted a definition of Farmland of Local Importance.

Grazing Land: Land on which the existing vegetation, whether grown naturally or through management, is suitable for grazing or browsing of livestock.

Urban and Built-up Land: Land used for residential, industrial, commercial, construction, institutional, public administrative purpose, railroad yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment plants, water control structures, and other development purposes. Highways, railroads, and other transportation facilities are also included in this category.

Other Land: Land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than forty acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.

Water: Water areas with an extent of at least 40 acres.

Williamson Act

The California Land Conservation Act of 1965, commonly known as the Williamson Act, was established based on numerous State legislative findings regarding the importance of agricultural lands in an urbanizing society. Policies emanating from those findings include those that discourage premature and unnecessary conversion of agricultural land to urban uses and discourage discontinuous urban development patterns, which unnecessarily increase the costs of community services to community residents. The Williamson Act authorizes each County to establish an agricultural preserve. Land that is within the agricultural preserve is eligible to be placed under a contract between the property owner and County that would restrict the use of the land to agriculture in exchange for a tax assessment that is based on the yearly production yield. The contracts have a 9-year term that is automatically renewed each year, unless the property owner or county requests a non-renewal or the contract is cancelled.

4.2.2 Discussion

- a) **No Impact.** The proposed project does occur adjacent to lands designated as Important Farmlands; however, the project will occur within the existing canal and canal levee right-of-way. The project would not result in the conversion of Prime Farmland, Farmland of Statewide Importance, Unique Farmland or Farmland of Local Importance, as shown on the maps prepared pursuant to Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use.
- b) **No Impact.** The project will not conflict with existing zoning for agricultural use, or a Williamson Act Contract. While there are Williamson Act Contracts on lands adjacent to the project, project activities in these areas will occur within the existing roadway right-of-way. Therefore, relative to land use designations and Williamson Act contracts, there would be no impact.
- c) **No Impact.** The proposed project would not conflict with existing zoning for, or cause the rezoning of forestland (as defined in Public Resources Code §1220(g)), timberland (as defined in Public Resources Code §4526), or Timberland Production (as defined in Government Code §51104(g)), because the

project site and the surrounding area does not contain forest land. The proposed project is located in the Sacramento Valley, a non-forested region.

- d) **No Impact.** The proposed project would not cause the rezoning or loss of forestland or timberland to non-forest use due to its location within Butte County. The proposed project is located on the valley floor of California’s Central Valley, and, as such does not contain forest land.
- e) **Less Than Significant.** The proposed project does not involve changes to the existing environment that could result in the conversion of Farmland to non-agricultural use. The proposed project involves the replacement of water district facilities that will improve water delivery to area farmers. Agricultural uses in the surrounding area will continue.

Mitigation: None required

4.3 Air Quality

Would the project:	Potentially Significant	Less Than Significant with Mitigation	Less Than Significant	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?			X	
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?		X		
c) 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 (including emissions that exceed quantitative thresholds for ozone precursors)?		X		
d) Expose sensitive receptors to substantial pollutant concentrations?		X		
e) Create objectionable odors affecting a substantial number of people?			X	

4.3.1 Setting

The proposed project is located within the Northern Sacramento Valley Air Basin (NSVAB). Summer conditions in the NSVAB are typically characterized by high temperatures and low humidity, with temperatures averaging from approximately 90 degrees Fahrenheit during the day and 50 degrees Fahrenheit at night. During the summer months, the prevailing winds are typically from the south. Winter conditions are characterized by occasional rainstorms interspersed with stagnant and sometimes foggy weather. The daytime average temperature is in the low 50s°F and nighttime temperatures average in the upper 30s°F. During winter, winds predominate from the south, but north winds frequently occur. Rainfall occurs mainly from late October to early May, with an average of 17.2 inches per year, but this amount can vary significantly each year.

Dispersion of local pollutant emissions are predominately affected by the prevailing wind patterns and inversions that often occur in the NSVAB. Within the NSVAB, two types of inversions can occur. During the summer months, sinking air forms a “lid” over the region and confines pollution to a shallow layer near the ground, which can contribute to photochemical smog problems. During winter nights, air near the

ground cools while the air aloft remains warm, which can cause poor dispersion of ground level pollutant emissions (Butte County General Plan EIR; BCAQMD, 2014).

Current Ambient Air Quality

Federal and state standards have been established for six criteria pollutants, including ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulates less than 10 microns and 2.5 microns in diameter (PM₁₀ and PM_{2.5}), and lead (Pb). The Butte County Air Quality Management District (BCAQMD) is the primary agency responsible for assuring that the federal and state ambient air quality standards are attained and maintained in Butte County. The BCAQMD operates a network of ambient air monitoring stations throughout Butte County. Depending on whether the standards for a particular criteria air pollutant has been met or exceeded, the local air basin is classified as being in “attainment” or “nonattainment.” Based on the most recent monitoring data, Butte County is a nonattainment area for both state and federal ozone standards, the state PM_{2.5} standards, and the state PM₁₀ standards. Butte County is in attainment for the state and federal standards for sulfur dioxide, nitrogen dioxide, carbon monoxide, and federal standards for PM_{2.5} and PM₁₀ (BCAQMD, 2018).

Air Quality Planning

The California Clean Air Act requires air districts to prepare a plan for air quality improvement for criteria pollutants for which the District is in nonattainment. The BCAQMD’s Air Quality Attainment Plan was first adopted in 1991 and updated in 1994, 1997, 2000 and 2003. In 2006, the District collaborated with other air pollution control districts in the NSVAB to prepare a joint Air Quality Attainment Plan. That joint plan has been updated in 2006, 2009 and 2012 as the Northern Sacramento Valley Planning Area Triennial Air Quality Attainment Plan. The attainment plan is the basis for an air district’s functional strategy to meet federal and state ambient air quality standards.

The BCAQMD, in its role of insuring projects are properly evaluated for consistency with ambient air quality standards and the Northern Sacramento Valley Planning Area Triennial Air Quality Attainment Plan, have prepared guidelines to assist applicants and lead agencies in evaluating potential air quality and greenhouse impacts that may occur with a proposed project. Established with these guidelines are screening criteria to determine whether or not additional modeling for criteria air pollutants is necessary for a project. The screening criteria listed in Table 4.3-2 were created using CalEEMod version 2013.2.2 for the given land use types. To determine whether or not a proposed project meets the screening criteria, the size and metric for the land use type (units or square footage) should be compared with that of the proposed project. If a project meets the applicable screening criteria, then further quantification of criteria air pollutants is not necessary, and it may be assumed that the project would have a less than significant impact for criteria air pollutants. If a project exceeds the size provided by the screening criteria for a given land use type then additional modeling and quantification of criteria air pollutants should be performed (BCAQMD, 2014).

LAND USE TYPE	MAXIMUM SCREENING LEVELS FOR PROJECTS
Single Family Unit Residential	30 units
Multi-Family (Low Rise) Residential	75 units
Commercial	15,000 square feet
Educational	24,000 square feet
Industrial	59,000 square feet
Recreational	5,500 square feet
Retail	11,000 square feet

Source: Butte County AQMD, CEQA Air Quality Handbook, 2014

4.3.2 Discussion

- a) **Less Than Significant.** The proposed project is the replacement of small, structurally deficient water control facilities. It does not involve the construction of new expanded facilities. The proposed project will be required to comply with all applicable rules, regulations, and control measures including permitting, prohibitions, and limits to emissions that work to reduce air pollution throughout California. Therefore, it will not conflict with or obstruct implementation of any air quality plans in Butte County. The proposed project would not create a source of new vehicle traffic, such as a new housing development or commercial uses, and thus there would be no added vehicle trips to the existing roadway network, and no long-term air quality impacts. The proposed project is located within the Northern Sacramento Valley Air Basin (NSVAB) and the jurisdiction of the Butte County Air Quality Management District (BCAQMD). Construction activities may result in minimal ground disturbance due to placement of water control components. To comply with the BCAQMD rules (3.0 and 3.16, visible and fugitive dust emissions), the District shall comply with all Best Available Mitigation Measures (BAMMs) for the control of construction related particulate emissions.
- b) **Less Than Significant With Mitigation Incorporated.** Implementation of the proposed project would result in the generation of short-term construction-related air pollutant emissions. Diesel fumes may be noticeable near the site; however, diesel fumes will be a short-term effect. All equipment must comply with California emissions standards. Exhaust emissions from construction equipment would contain reactive organic gases (ROG), nitrogen oxides (NOx), carbon monoxide (CO) and particulate matter less than 10 microns in diameter (PM10). Particulate matter less than 10 microns emissions would also result from windblown dust (fugitive dust) generated during construction activities. As shown in **Table 1**, per the California Ambient Air Quality Standards (CAAQS) the project area is designated as non-attainment for ozone, and a non-attainment area for 24-hour PM10.

The project would not result in construction related emissions exceeding BCAQMD emission thresholds, having a less than significant impact to regional air quality. The incorporation of **Air Quality MM-1**, would ensure construction related emissions impacts would be less than significant.

Table 2: Attainment Status for Criteria Air Pollutants for Butte County CA.

Pollutant	State	Federal
NOx	Attainment	Attainment
SO ₂	Attainment	Attainment
CO	Attainment	Attainment
1-hour Ozone	<i>Non-Attainment</i>	_____
8-hour Ozone	<i>Non-Attainment</i>	<i>Non-Attainment</i>
24-Hour PM ¹⁰	<i>Non-Attainment</i>	Attainment
24-Hour PM ^{2.5}	No Standard	Attainment
Annual PM ¹⁰	Attainment	No Standard
Annual PM ^{2.5}	<i>Non-Attainment</i>	Attainment
Source: BCAQMD 2018		

- c) **Less Than Significant With Mitigation Incorporated.** The project involves replacement of water control structures throughout the water district, and will not generate new traffic, thereby generating more emissions, as would new development (i.e., residential or commercial land uses).

The project will generate short-term construction related emissions associated with equipment used for construction activities. These emissions would contain ozone precursors, PM₁₀ and PM_{2.5}. Additional particulate matter emissions in the form of fugitive dust could be generated during ground disturbing activities for placement of weir boxes, culverts, headwalls, and head gates.

The proposed project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard. Each of the above impacts are temporary, local, and construction related. The incorporation of **Air Quality MM-1** would reduce these impacts to a less than significant level. Air quality mitigation measures are consistent with the requirements of the Butte County General Plan and the BCAQMD specifications for pollution and dust control.

- d) **Less Than Significant With Mitigation Incorporated.** Residences can be found in close proximity to the project vicinity within and surrounding the community of Richvale. Project activities consist of minor water control infrastructure removal and upgrades. Although residences are found in close proximity to the project area, there are no schools or hospitals in the area and no substantial pollutant concentrations are anticipated to occur. Temporary construction activities would result in particulate emissions in an area designated as non-attainment. However, implementation of BMM's and Standard Mitigation Measures for construction outlined in section the BCAQMD CEQA review, and the incorporation of **Air Quality MM-1** would minimize the exposure of sensitive receptors to fugitive dust to the maximum extent possible.
- e) **Less Than Significant.** Other than construction activities (diesel odors may be noticeable near the construction site), no long-term odor producing activities would result from the project. Therefore, the proposed project would not result in less than significant objectionable odor impacts.

4.3.3 Mitigation:

Air Quality MM-1

The following best practice measures as per BCAQMD to reduce impacts to air quality will be incorporated into the project during construction as applicable. These measures are intended to reduce criteria air pollutants that may originate from the site during the course of construction operations.

Diesel PM Exhaust from Construction Equipment and Commercial On-Road Vehicles Greater than 10,000 Pounds

- All on- and off-road equipment shall not idle for more than five minutes. Signs shall be posted in the designated queuing areas and/or job sites to remind drivers and operators of the five-minute idling limit.
- Idling, staging and queuing of diesel equipment within 1,000 feet of sensitive receptors is prohibited.
- All construction equipment shall be maintained in proper tune according to the manufacturer's specifications. Equipment must be checked by a certified mechanic and determined to be running in proper condition before the start of work.
- Install diesel particulate filters or implement other CARB-verified diesel emission control strategies.

- Shall not operate a diesel-fueled auxiliary power system (APS) to power a heater, air conditioner, or any ancillary equipment on that vehicle during sleeping or resting in a sleeper berth for greater than 5 minutes at any location when within 100 feet of a restricted areas.
- To the extent feasible, truck trips shall be scheduled during non-peak hours to reduce peak hour emissions.

Fugitive Dust

Construction activities can generate fugitive dust that can be a nuisance to local residents and businesses near a construction site. Dust complaints could result in a violation of the District’s “Nuisance” and “Fugitive Dust” Rules 200 and 205, respectively. The following is a list of measures that may be required throughout the duration of the construction activities:

- Reduce the amount of the disturbed area where possible.
- Use of water trucks or sprinkler systems in sufficient quantities to prevent airborne dust from leaving the site. An adequate water supply source must be identified. Increased watering frequency would be required whenever wind speeds exceed 15 mph. Reclaimed (non-potable) water should be used whenever possible.
- All dirt stockpile areas should be sprayed daily as needed, covered, or a District approved alternative method will be used.
- Permanent dust control measures identified in the approved project revegetation and landscape plans should be implemented as soon as possible following completion of any soil disturbing activities.
- Exposed ground areas that will be reworked at dates greater than one month after initial grading should be sown with a fast-germinating non-invasive grass seed and watered until vegetation is established.
- All disturbed soil areas not subject to re-vegetation should be stabilized using approved chemical soil binders, jute netting, or other methods approved in advance by the Butte County Air Quality Management District.
- Vehicle speed for all construction vehicles shall not exceed 15 mph on any unpaved surface at the construction site.
- All trucks hauling dirt, sand, soil, or other loose materials are to be covered or should maintain at least two feet of freeboard (minimum vertical distance between top of load and top of trailer) in accordance with local regulations.
- Install wheel washers where vehicles enter and exit unpaved roads onto streets, or wash off trucks and equipment leaving the site.
- Sweep streets at the end of each day if visible soil material is carried onto adjacent paved roads. Water sweepers with reclaimed water should be used where feasible.
- Post a sign in prominent location visible to the public with the telephone numbers of the contractor and the Butte County Air Quality Management District - (530) 332-9400 for any questions or concerns about dust from the project.”

All fugitive dust mitigation measures required should be shown on grading and building plans. In addition, the contractor or builder should designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite. Their duties shall include holidays and weekend period when work may not be in progress. The name and telephone number of such persons shall be provided to the District prior to land use clearance for map recordation and finished grading of the area.

Please note that violations of District Regulations are enforceable under the provisions of California Health and Safety Code Section 42400, which provides for civil or criminal penalties of up to \$25,000 per violation.

4.4 Biological Resources

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		X		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?			X	
c) Have a substantial adverse effect on protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?			X	
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?			X	
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
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?				X

4.4.1 Setting

A Biological Resources Assessment (BRA) report (**Appendix A**), which assessed the potential for significant impacts to special-status species, was prepared for the proposed project by NorthStar in June 2019. As part of the BRA, a list of special-status plant and animal species was compiled from the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation database, California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDDB), and the California Native Plant Society (CNPS) Online Inventory of Rare and Endangered Plants to determine special-status species that may potentially be affected by the proposed project. All the special-status species listed by the USFWS, CDFW, and CNPS occurring within the USGS quadrangles surrounding the project area.

The Biological Study Area (BSA) is composed primarily of irrigation canals and rice fields, small areas of riparian habitat are found along the canals in the southern portion of the BSA. More urban and residential habitats are found within the central portion of the BSA within and surrounding Richvale. Vegetation observed within the District included species typical of urban and rural areas, pastures, rice, disturbed grasslands, riparian areas, and freshwater wetland habitats throughout the valley. The vegetation along the District's canals is dominated by non-native grasses and forbs along the top and upper portion of the canal banks and hydrophytic species along the lower portions near the water line and within the canal.

Non-native grass and forb species observed along the upper portions of the canal banks include johnsongrass (*Sorghum halepense*), crab grass (*Digitaria sanguinalis*), slender wild oat (*Avena barbata*), seashore vervain (*Verbena littoralis*), yellow star thistle (*Centaurea solstitialis*), field mustard (*Brassica rapa*), curly dock (*Rumex crispus*), horseweed (*Erigeron canadensis*), prickly lettuce (*Lactuca serriola*) and field bindweed (*Convolvulus arvensis*). The composition of species is heavily affected by mowing and herbicide applications conducted during routine canal maintenance of the access roads. Hydrophytic species encountered along the lower portions of the canal banks and within the canals include cattail (*Typha latifolia*), hardstem bulrush (*Schoenoplectus acutus*), water primrose (*Ludwigia hexapetala*), marsh purslane (*L. peploides*), mosquito fern (*Azolla filiculoides*), duckweed (*Lemna* sp.), and watergrass (*Echinochola crus-galli*).

The vegetation in the more urban portions of the district consists of ornamental tree species typical of residential landscaping including fruitless mulberry (*Morus alba*), Chinese pistache (*Pistacia chinensis*), palm (*Washingtonia* sp.), eucalyptus (*Eucalyptus* sp.), silver maple (*Acer saccharinum*), camphor (*Cinnamomum camphora*), cypress, and birch (*Betula* sp.). Ground cover consists of manicured landscaping including a variety of shrubs and herbaceous species and lawn.

Soils within the District generally consist of clay alluvium over loamy alluvium. A majority of the District is covered by four soil map units defined by the Natural Resources Conservation Service (NRCS), including Lofgren-Blavo Complex 0 to 1 percent slope, Esquon-Neerdobe Complex, 0 to 1 percent slopes, Duric Xerarents-East Biggs Complex 0 to 1 percent slope, and Esquon Silt Loam 0 to 1 percent slope. Topography is generally flat sloping to the southwest with elevations ranging from approximately 110 feet above mean sea level (msl) to approximately 60 feet above msl near the southwestern portion of the District. Weather within the District is typical of Mediterranean climates with hot, dry summers and mild winters with low to moderate rainfall amounts. Average rainfall is approximately 27 inches with a majority falling between November and March

Due to the generally disturbed nature of the BSA, suitable habitat for special-status plant species is minimal to non-existent. No special-status plant species were determined to have potential to occur within the BSA due to the disturbed nature of the BSA, continued agricultural activities in the vicinity, and continued canal maintenance. Additionally, species such as Sanford's arrowhead and wooly rose mallow that can be found in freshwater environments in the northern Central Valley were not observed during biological surveys.

Special-status wildlife species with at least moderate potential to occur within the project area include, giant garter snake (*Thamnophis gigas*), northwestern pond turtle (*Actinemys marmorata*), bald eagle (*Haliaeetus leucocephalus*), greater sandhill crane (*Antigone canadensis*), loggerhead shrike (*Lanius ludovicianus*), merlin (*Falco columbarius*), northern harrier (*Circus hudsonius*), Swainson's hawk (*Buteo swainsoni*), osprey (*Pandion haliaetus*), tricolored blackbird (*Agelaius tricolor*), and birds protected by the Migratory Bird Treaty Act (MBTA).

In addition to the BRA, a Biological Assessment (BA) and GGS Habitat Assessment (**Appendix B**) were prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act (ESA) (16 U.S.C. 1536 (c)). The BA consisted of plant and biological field surveys to identify any federally listed special-status species habitat located within the project corridor. The BA proposes, through field studies conducted that the project “may affect and is likely to adversely affect” giant garter snake (GGS). In addition, measures for avoidance and minimization would ensure impacts to aquatic and upland habitat will be reduced. The District will implement avoidance and minimization measures as detailed in applicable regulatory permits to avoid impacts. Measures may include but are not limited to, staging the equipment and the excavated material in designated areas, and using erosion control methods such as silt fencing and straw wattles. If deemed necessary by USFWS and/or CDFW during the ESA Section 7 consultation process and/or the Fish and Game Code Section 2080.1, respectively, the District will also purchase compensatory mitigation credits for the loss of aquatic and upland habitat.

Table 2 includes federally listed special-status species with at least moderate potential of occurring within the project (including the potential for foraging habitat) and an associated effect determination.

Table 3: Federally listed Species with Potential to Occur in the Action Area and Effect Determinations

Species	Effect Determination
Giant garter snake (<i>Thamnophis gigas</i>)	May affect, likely to adversely affect

Table 3 includes State listed species and CDFW Species of Special Concern with at least moderate potential to occur within the project area.

Table 4: State listed Species with Potential to Occur in the Action Area and Associated Status

Species	Status
Giant garter snake (<i>Thamnophis gigas</i>)	State Threatened
Northwestern pond turtle (<i>Emys marmorata</i>)	Species of Special Concern
Bald eagle	State Endangered
Greater sandhill crane	State Threatened
Loggerhead shrike	Species of Special Concern
Merlin	CDFW Watchlist
Modesto Population of Song Sparrow	Species of Special Concern
Northern harrier	Species of Special Concern
Swainson’s hawk (<i>Buteo swainsoni</i>)	State Threatened
Osprey	Species of Special Concern
Tricolored blackbird	State Candidate Endangered

4.4.2 Discussion

- a) **Less Than Significant With Mitigation.** Field surveys of the project area were conducted between June 19, 2018 and January 24, 2019 by NorthStar biologists Carol Wallen, Matt Rogers, and NorthStar environmental scientists Andrew Huneycutt, Bryn Copson, and Jake Sivertson, as well as Swaim Biological, Inc. biologists Eric Britt, Jeff Mitchell, and Cole Paris. Based on the survey results and literature research, special-status species have at least moderate potential to occur within the project area, include Sanford’s arrowhead (*Sagittaria sanfordii*), woolly rose-mallow (*Hibiscus lasiocarpus* var. *occidentalis*), giant garter snake (*Thamnophis gigas*), northwestern pond turtle (*Actinemys marmorata*), bald eagle (*Haliaeetus leucocephalus*), greater sandhill crane (*Antigone*

canadensis), loggerhead shrike (*Lanius ludovicianus*), Merlin (*Falco columbarius*), northern harrier (*Circus hudsonius*), Swainson's hawk (*Buteo swainsoni*), osprey (*Pandion haliaetus*), tricolored blackbird (*Agelaius tricolor*), migratory birds and raptors protected by the Migratory Bird Treaty Act (MBTA).

Giant Garter Snake

The giant garter snake is a federal and state listed threatened species endemic to the wetlands of the Sacramento and San Joaquin Valleys of California. The giant garter snake prefers the high-quality natural wetlands which include marshes, ponds, small lakes, low-gradient streams with silty substrates, and managed wetlands. Additionally, it has become readily apparent giant garter snakes inhabit agricultural wetlands and other associated waterways such as irrigation and drainage canals, sloughs, and adjacent uplands in the Central Valley. Because of the direct loss of natural habitat, GGS now relies on rice farming in the Sacramento and San Joaquin Valley, but also uses managed marsh areas in federal national wildlife refuges and state wildlife areas. Giant garter snakes are typically absent from larger rivers with sand, rock and gravel substrates, wetlands with sand, gravel, or rock substrates due to a lack of habitat and emergent vegetation. Riparian woodlands typically do not provide suitable habitat because of excessive shade, lack of basking sites, and absence of prey populations (USFWS 2006). The GGS is active from early spring (April-May) through mid-fall (October-November), although this period of activity varies based on weather. During the winter they are much less active and rarely emerge from burrows. When active, the species usually remains near wetland habitat, although they can move up to 0.8 km in a day (USFWS 1999).

The loss and fragmentation of habitat is the leading threat to GGS throughout the range of the species. Habitat loss has occurred from urban expansion, agricultural conversion, and flood control. Fragmentation limits dispersal and isolates populations of the giant garter snake, increasing the likelihood of inbreeding, decreasing fitness, and reducing genetic diversity. Some populations of the giant garter snake are subject to the cumulative effects of a number of other existing and potential threats, including roads and vehicular traffic, predation by non-native species and climate change.

Primary habitat requirements consist of 1) adequate water during the snake's active season (early-spring through mid-fall) to provide food and cover; 2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat during the active season; 3) grassy banks and openings in waterside vegetation for basking; and 4) higher elevation uplands for cover and refuge from floodwaters during the snake's dormant season in the winter (USFWS 2006).

According to the USFWS Recovery Plan for the Giant Garter Snake released in 2017, habitat components include; 1) a fresh water component with protective emergent vegetative cover that will allow foraging, 2) An upland component near the aquatic habitat that can be used for thermoregulation and for summer shelter in burrows, and 3) An upland refugia component that will serve as winter hibernacula. Further, researchers and experts acknowledge qualitative components for ideal aquatic and upland habitat. Ideal aquatic habitat has 1) water present from March through November; 2) slow moving or static water flow with mud substrate, 3) the presence of emergent bankside vegetation that provides cover from predators and may serve in thermoregulation, 4) the absence of a continuous canopy of riparian vegetation, 5) available prey in the form of small amphibians and small fish, 6) thermoregulation sites with supportive vegetation such as folded tule clumps immediately adjacent to escape cover, 7) the absence of large predatory fish, and 8) the absence of recurrent flooding, or where flooding is probable the presence of upland refugia. Ideal upland habitat contains, 1) available bankside vegetative cover, typically tule or cattail, for screening from potential predators, 2) available permanent shelter, such as bankside cracks or crevices, holes, or small mammal burrows and 3) free of poor grazing management practices (i.e., grazing to the point at

which giant garter snake refugia has been reduced or eliminated). An important portion of the upland component is upland refugia for the winter months when the snakes hibernate and enter a lethargic state similar to mammalian hibernation. Over-wintering sites generally consist of mammal burrows along canal or marsh banks, or rock slope protection along roadways or canal edges.

Giant garter snakes feed primarily on small fish, tadpoles, and frogs. The GGS inhabits small mammal burrows and other soil crevices above prevailing flood elevations throughout its winter dormancy period. The snakes typically select burrows with sunny exposure along south and west facing slopes. The breeding season extends through March and April, and females give birth to live young from late July through early September. Brood size is variable, ranging from 10 to 46 young, with a mean of 23 (Hansen and Hansen, 1990). Young immediately scatter into dense cover and absorb their yolk sacs, after which they begin feeding on their own. Although growth rates are variable, young typically more than double in size within the first year; sexual maturity averages three years for males and five years for females (Hansen and Hansen, 1990).

The project area meets all the essential GGS habitat components, as set forth in the November 13, 1997 USACE Programmatic Formal Consultation for GGS within the Northern California counties, including Butte County. In addition to the habitat components set forth in the USFWS Recovery Plan.

The BSA contains adequate water year around due to the regulated irrigation within the BSA. Rice fields are available adjacent to the District's canals in many areas during the snake's active season creating an alternative aquatic habitat for the species to utilize. Additionally, emergent vegetation in the form of tule, cattail, or water primrose is present in portions of the canal which provides suitable aquatic habitat for the species to forage, thermoregulate, and escape predators.

Many sites within the BSA contain bankside vegetation that creates a protective screen against predators. Permanent shelters are available in the form of bankside cracks, crevices, holes, and small mammal burrows. Additionally, manmade structures present within the BSA could be utilized for shelter such as open spaces between rock slope protection and the back sides of abutments/structures.

The higher elevation uplands do contain refugia, which the snake inhabits during winter months. Several types of refugia are commonly encountered along the District's canals including mammal burrows, rock slope protection near structures, and crevices alongside conveyance structures.

Several GGS were detected during surveys conducted by NorthStar and Swaim biologists, additionally a number of occurrences are found in close proximity to the project area. The CNDDB contains three records for GGS within one mile of the overall project footprint. These include a record of a female captured in 1998 at the junction of Richvale East Road and Butler Canal, a record of an individual collected in 1942 about two miles north of Richvale, and three individuals captured about 3.7 miles west-southwest of Richvale in 2013. Approximately 14 additional GGS records occur within five miles of the project footprint, most of which are located to the north or west of the project. Each of these occurrences near the project area may be comprised of multiple GGS individuals.

The project will temporarily and permanently disturb potential aquatic and upland habitat. The inclusion of **Biological Resources MM-1** will ensure impacts to GGS are less than significant.

Northwestern Pond Turtle

The northwestern pond turtle can be found throughout California and is the only abundant native turtle in California. They are associated with permanent or nearly permanent water in a wide variety of habitats at elevations ranging from near sea level to 4,700 feet. They require basking sites

including partially submerged logs, rocks, mats of floating vegetation, or open mud banks. The northwestern pond turtle hibernates in colder areas underwater on muddy bottoms. Nesting sites are typically constructed along the banks of permanent water in soils at least 10 cm deep and must have high internal humidity for eggs to develop and hatch (Jennings and Hayes 1994).

The nearest known occurrences are found in Gold Run Creek and near the Thermalito Afterbay along the Feather River, additionally the species is found in the Upper Butte Basin Wildlife Area and along Butte Creek west of Richvale. The species was not observed during biological surveys of the BSA.

Implementation of **Biological Resources MM-2** would ensure project related impacts to western pond turtles would be less than significant.

Bald Eagle

The bald eagle is known from Alaska to California and in California it is a permanent resident, now restricted to breeding mostly in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity Counties. Bald eagles are also found in a few favored inland waters in Southern California. They are more common at lower elevations, and are not found in the high Sierra Nevada. They require large bodies of water or free flowing rivers with abundant fish, and adjacent snags or other perches. Bald eagles will occasionally forage in flooded fields for displaced voles or other small mammals. They will also scavenge dead fish, water birds, and mammals, and have been known to steal from osprey. Typically nests within 1.6 km (1 mile) of water in large, old-growth, or dominant live trees with open branchwork (less than 40% canopy). Nests are usually located 16-61 m (50-200 feet) above the ground. Breeding occurs from February to July; however, they don't begin nesting if human disturbance is evident.

There were no bald eagle nests discovered during biological surveys of the BSA, however, the species was observed foraging within the BSA during January of 2019. It is not expected the species would nest within the BSA due to its distance from a large body of water such as the Sacramento River or Lake Oroville. The species is regularly seen during the winter months when they come into the Central Valley following migrating waterfowl.

The implementation of **Biological Resources MM-3** will ensure impacts to bald eagle would be less than significant.

Greater Sandhill Crane

The greater sandhill crane is a state threatened species that can be found in open habitats with scattered shrubs, bogs, marshes, and prairies across northern North America and the southeastern United States. Typically, they winter in immense flocks in Bosque del Apache, New Mexico, and the Anahuac National Wildlife Refuge, Texas. Greater sandhill cranes are omnivores that eat insects but will also take small birds, mammals, amphibians, reptiles, and fish. Nesting occurs in wetlands with vegetated areas. (Cornell lab 2017). In northern California, greater sandhill cranes nest in northeastern California and winter in the Central Valley where they are found readily in agricultural areas where they will forage on waste grain rice. The species arrives in the Central Valley in mid-October and depart by March or April to nesting grounds.

Greater sandhill crane is not expected to nest within the BSA, but is expected to occur within the Central Valley. Sandhill cranes were observed during biological surveys of the BSA during January 2019, they could not be readily identified to subspecies due to distance from observers.

The implementation of **Biological Resources MM-3** will ensure impacts to greater sandhill crane would be less than significant.

Loggerhead Shrike

The loggerhead shrike is a common resident and winter visitor in lowlands and foothills throughout California. They can be found in open habitats with scattered shrubs, trees, posts, fences, utility lines or other perches. Typically, they occur in open canopied valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, pinyon-juniper, juniper, desert riparian, and Joshua tree habitats. They rarely occur in heavily urbanized areas but are often found in open croplands. Loggerheaded shrikes mainly eat large insects, but also take small birds, mammals, amphibians, reptiles, fish, carrion, and various other invertebrates. They nest in shrubs or trees at heights ranging from 0.4 to 15 meters above the ground. Adults lay eggs from March to May with male and females tending their young into July or August.

Open areas to the west of the towns of Biggs and Gridley provide suitable open habitat for the species. It is not expected the species would nest within the Central Valley but the species would be expected to be found foraging within the area during the winter months. The species was not observed during biological surveys of the BSA.

Implementation of **Biological Resources MM-3** will ensure impacts to loggerhead shrike will be less than significant.

Merlin

The merlin is a small, stocky falcon with a blocky head. In general, the species is dark overall with a broadly striped chest although their coloration varies geographically and by gender. The merlin nests in forested openings, edges and along rivers across northern North America. During migration and in the winter the species can be found in open areas, open forests, grasslands, and coastal areas. The species is a dynamic predator that feeds primarily on small birds but will also supplement its diet with small mammals and insects.

The species does not breed in California and is an uncommon winter migrant from approximately September to May. Numbers have declined markedly in California in recent decades. The species will not be found during the breeding season within the BSA but it is possible it could occur during the winter months as suitable foraging habitat is present within the BSA. The species was not observed during biological surveys of the BSA.

Implementation of **Biological Resources MM-3** will ensure impacts to merlin will be less than significant.

Northern Harrier

Northern harriers are a raptor commonly found near wetlands and open grasslands perched on or flying close to the ground. The northern harrier is one of the few birds of prey that is frequently polygynous when ecological conditions permit. Nests are constructed on the ground, typically in dense, low vegetation that provides a visual barrier and cover. In drier habitats, the nest consists of a loose, thin layer of sticks. In wetter situations, nests are larger, more substantial structures. Nests are built by the female and typically consist of grass, reeds, and small sticks. Breeding activity begins in April, concluding in September, with a peak in activity from June to July. A single brood of four to six eggs are incubated by the female. Incubation begins with the last egg and lasts about 29–39 days.

The female broods the young for about 4 weeks while the male provisions the female and young with prey items. Young begin to leave the nest, moving around into the surrounding vegetation, at about 2 weeks of age. The amount of time spent at the nest steadily decreases after this point until fledging. First flight generally occurs at 29–34 days of age. Young remain in the vicinity of the nest until dispersal.

Northern harrier was observed regularly during biological surveys of the BSA. The species was commonly seen in the agricultural areas of the BSA foraging over rice, pasture, rice, converted wetland, and marsh habitat.

Implementation of **Biological Resources MM-3** will ensure impacts to northern harrier will be less than significant.

Osprey

The osprey is a migratory raptor species that feeds almost exclusively on live fish. Foraging in clear, open waters, ospreys dive feet first to catch their prey. This species is considered a Species of Special Concern by the CDFG, despite recent population increases following the elimination of pesticide use such as DDT, which caused population decline during the 1950s and up to 1970. Osprey populations appear to be increasing since the 1970s. Nests are constructed from sticks to form platforms on top of dead-topped trees, cliffs, man-made structures (i.e. cell phone and utility towers), and occasionally on the ground. Ospreys arrive on nesting grounds mid-March to early April and lay between 1-4 eggs. Southern migration occurs in October, with osprey flying along the coast and western slopes of Sierra Nevada in October to Central and South America (CDFG 2005).

No large osprey nests were observed within the BSA; however, suitable nesting habitat is present within the larger Fremont cottonwoods found along the Cherokee Canal.

Implementation of **Biological Resources MM-3** will ensure impacts to osprey will be less than significant.

Song Sparrow (Modesto Population)

The Modesto population is a subspecies of song sparrow and is a California species of special concern. It is endemic to California and lives only in the north-central portion of the Central Valley. The highest densities occur in the Butte Sink in Butte County, and along the Sacramento-San Joaquin Delta. Breeding records exist for Butte, Colusa, Sutter, Sacramento, and San Joaquin counties. While it is still common in some areas, it is believed that large-scale loss of wetland and riparian habitat has caused population decline and extirpation in other areas. The sparrow is found in emergent freshwater marshes, riparian willow (*Salix* spp.) thickets, and valley oak forests with a blackberry understory, and sometimes along vegetated irrigation canals and levees. It breeds from mid-March to early August. (Shuford and Gardali 2008; Humple and Geupel 2004). In general, song sparrows are small with a short bill and brown streaking on a white chest and flanks (Cornell Laboratory of Ornithology 2016). The sparrow's diet consists primarily of seeds for much of the year, but insects become increasingly important, reaching more than 70 percent of its diet in May. Habitat loss and fragmentation—as well as nest predation by several species of mammals, snakes, and birds, including feral domestic cats—pose threats to the sparrow (Shuford and Gardali 2008; Humple and Geupel 2004).

There are no distinctive differences in appearance between song sparrows that allow absolute visual identification of a song sparrow as being part of the “Modesto population.” Although designation as

subspecies for the “Modesto” song sparrow is pending further research, it is recognized as such and has been listed as a California SSC.

Emergent habitat within the canals found in BSA appears suitable and similar to areas where individuals of the Modesto population are typically found. The species was not observed during biological surveys of the BSA.

Implementation of **Biological Resources MM-3** will ensure impacts to Modesto Population song sparrow will be less than significant.

Swainson’s Hawk

Swainson’s hawk is listed as Threatened under the California Endangered Species Act (CESA). It is a long-distance migrant with nesting grounds in western North America. Swainson’s hawks arrive in the Central Valley between March and early April to establish breeding territories. Breeding occurs from late March to late August, peaking in late May through July (Fitzner 1980).

The Swainson’s hawk nests in isolated trees, small groves, or large woodlands, adjacent to open grasslands or agricultural fields. This species typically nests near riparian areas; however, it has been known to nest in urban areas as well. Nest locations are usually in close proximity to suitable foraging habitats, which include grasslands, fallow fields, irrigated pastures, alfalfa and other hay crops, and low-growing row crops. Swainson’s hawks primarily prey upon small rodents such as ground squirrels (*Spermophilis* spp.), pocket gophers (*Thomomys* spp.), voles (*Microtus* spp), but insects, reptiles, and birds may be consumed as well (Snyder and Wiley 1976; Fitzner 1980; Estep 1989). Swainson’s hawks leave their breeding grounds to return to their wintering grounds in late August or early September (Bloom and DeWater 1994). Swainson’s hawks’ largest threats are loss of habitat and secondary poisoning from insecticides on their wintering grounds (Woodbridge et al. 1995a).

The large trees present within the BSA could provide suitable nesting habitat for Swainson’s hawk additionally, fallowed fields may provide suitable foraging habitat for the species. The nearest known occurrences for the species are found along the Cherokee Canal and Butte Creek to the north and west of the proposed project location. No Swainson’s hawk nests were observed during biological surveys of the BSA nor was the species observed.

The implementation of **Biological Resources MM-4** will ensure impacts to Swainson’s hawk would be less than significant.

Tricolored Blackbird

Tricolored blackbird is a state threatened species under the California Endangered Species Act (CESA). The tricolored blackbird occurs throughout California’s Central Valley and in coastal habitats from Sonoma County south. The tricolored blackbird requires dense fresh emergent wetlands to nest and breed, and forages in grassland and cropland habitats. Its nests are made from mud and plant materials and colonies can consist of 50 pairs to as large as 30,000 pairs. Tricolored blackbirds require open, accessible water, protective nesting substrates (flooded, thorny, or spiny vegetation), and suitable foraging space within a few miles of the nesting colony. In response to loss of fresh emergent wetland habitat, tricolored blackbirds have been increasingly observed to utilize Himalayan blackberry (*Rubus armeniacus*), elderberry, poison oak (*Toxicodendron diversilobum*), and grain fields for colony establishment.

The habitats present in the BSA provide large areas of suitable foraging habitat for the species. Additionally, the BSA provides suitable nesting habitat for the species as Himalayan blackberry and emergent vegetation can be found along the District's canals. No active tricolored blackbird colonies were observed during biological surveys of the BSA. Many of the occurrences found in the vicinity of Richvale have been determined to be possibly extirpated. Most of the occurrences are from the 1930s and during re-surveys in 2011 no birds were observed.

Implementation of **Biological Resources MM-3** will ensure impacts to tricolored blackbird would be less than significant.

Migratory Birds and Raptors

The federal Migratory Bird Treaty Act (MBTA) and California F.G.C. Sections 3503 and 3800 protect the occupied nests and eggs of migratory and non-game bird species. The Federal Bald and Golden Eagle Protection Act also prohibits the take of bald and golden eagles and their nests. Birds nest in a variety of places including trees, shrubs, man-made structures, and the ground. Work buffers around migratory birds and their nests are typically needed to minimize impacts to these species. Any proposed project must take measures to avoid the take of any migratory and non-game birds, nests, or eggs.

Numerous migratory bird species were observed during the wildlife survey. Active cliff and barn swallow nesting was observed on concrete structures along the District's canals. With the implementation of **Biological Resources MM-3** impacts to migratory birds and raptors would be less than significant.

- b) **Less Than Significant.** The proposed project will temporarily and permanently impact potential GGS aquatic and upland habitat by replacing the existing water control infrastructure with new modern facilities. Temporary impacts to habitat will be returned to pre-construction conditions. Mitigation credits for permanent impacts to GGS habitat would be purchased at a ratio determined by USFWS and/or CDFW from a USFWS and CDFW approved mitigation bank.
- c) **Less Than Significant.** Although the District's canals are likely jurisdictional under Section 404 of the Clean Water Act (CWA), the replacement of the infrastructure will be conducted under an U.S. Army Corps of Engineers (USACE) maintenance exemption. The project will apply for a "no permit needed" determination from the USACE and subsequently the Regional Water Quality Control Board (RWQCB) for the CWA Section 401 Water Quality Certification. The proposed project would be required to adhere to the applicable performance standards of the USACE and the RWQCB via that regulatory process. The following regulatory permits will be acquired prior to the start of any grading or construction activities within the project area:

- USFWS Section 7 ESA Informal Consultation
- F.G.C. Section 1602 Streambed Alteration Agreement from CDFW
- F.G.C. Section 2080.1 Notification and Consistency Determination from CDFW

Obtaining the appropriate regulatory permits ensures: 1) compliance with applicable state and federal laws, 2) that potential impacts to wetlands and other waters of the U.S., waters of the state, and streambed and banks (including irrigation ditches), and listed species are mitigated appropriately (including the payment of mitigation fees), and 3) minimizes, reduces, or avoids potentially significant impacts.

- d) **Less than Significant.** The proposed project would involve the removal of the current structurally deficient water delivery infrastructure and replacing them with modern facilities along the District's canals. Temporary disturbances resulting from vegetation removal will be restored to pre-project conditions. Additionally, aquatic habitat that may support GGS will be monitored prior to and during construction to minimize potential impacts. The project would not result in the introduction of permanent barriers to movement of any resident or migratory fish or wildlife species, nor would it result in the introduction of any new long-term factors (light, fencing, noise, human/presence and/or domestic animals) which could hinder the normal activities of wildlife.
- e) **No Impact.** The proposed project would not conflict with any local plans or policies that protect biological resources. The project would be required to adhere to the mitigation measures and standard/permitting requirements of regulatory agencies, as set forth in this study.
- f) **No Impact.** The project site is not subject to the provisions of any adopted habitat conservation plans or natural community conservation plans, as the Butte Regional Conservation Plan is yet to be adopted. Regarding local plans, policies and ordinances, the proposed project would result in no impact.

4.4.3 Mitigation:

Biological Resources MM-1 Obtain Regulatory Permits and Implement Avoidance and Minimization Measures

- The project will conduct the following consultations and/or permits, as necessary and applicable:
 - USFWS Section 7 ESA Informal Consultation
 - F.G.C. Section 1602 Streambed Alteration Agreement from CDFW
 - F.G.C. Section 2080.1 Notification and Consistency Determination from CDFW
- Given the GGS habitat located within the project boundaries, the purchase of compensatory mitigation will likely be required by USFWS and/or CDFW. If the purchase of mitigation credits is deemed applicable and necessary by USFWS and/or CDFW during the ESA Section 7 consultation process and/or Fish and Game Code Section 2080.1 consistency determination process, the District shall purchase compensatory mitigation for permanent loss of suitable aquatic and upland habitat for GGS. Mitigation credits would be purchased at the ratio identified by USFWS and/or CDFW. If mitigation credits for permanent impacts to GGS habitat are required, then the following compensatory mitigation is proposed: Temporarily impacted habitat along the canal is anticipated to readily reestablish following construction activities. Additionally, to hasten revegetation, upland areas adjacent to the canals will be hydroseeded with a mixture of native species to promote reestablishment of bankside vegetation. Once construction is completed and pre-construction conditions (topography and hydrology) are reestablished they should revert to pre-construction vegetation character within a few months to a year following completion of project activities.

If work is to occur during the GGS active season, temporary impacts totaling 0.147 acres will be mitigated at a ratio of 0.5:1 for a total compensation for temporary impacts of 0.0735 acres. Permanent impacts totaling 0.074 acres will be mitigated at a ratio of 3:1 for a total compensation for permanent impacts of 0.222 acres. The total number of acres (temporary impact and permanent impact) of mitigation would be 0.2955 acres.

If work is to occur during the GGS inactive season, temporary impacts totaling 0.147 acres will be mitigated at a ratio of 1:1 for a total compensation for temporary impacts of 0.147 acres. Permanent impacts totaling 0.074 will be mitigated at a ratio of 4:1 for a total compensation for permanent impacts of 0.296 acres. The total number of acres (temporary impact and permanent impact) of mitigation would be 0.443 acres. The following table summarizes the proposed mitigation for the project.

Table 5: Proposed Mitigation for Active and Inactive Season Work.

Active Season Work						
Mitigation Requirements	Temporary Impacts Mitigation		Permanent Impact Mitigation		Total Mitigation Required/Cost	
	Impact (ac)	(0.5:1)	Impact (ac)	(3:1)	Acres	Cost
Suitable Habitat Impact Totals	0.147	0.0735	0.074	0.222	0.2955	\$16,253
Inactive Season Work						
Mitigation Requirements	Temporary Impacts		Permanent Impacts		Total Mitigation Required/Cost	
	Impact (ac)	(1:1)	Impact (ac)	(4:1)	Acres	Cost
Suitable Habitat Impact Totals	0.147	0.147	0.074	0.296	0.443	\$24,365

Note: Cost based on information provided by Westervelt Ecological Services.

In the event work spans both the inactive and active season, mitigation would be assessed at the ratios listed above, as applicable, and in proportion to the type and area of impact occurring in each period.

The project will incorporate the avoidance and minimization measures (AMMs), standard BMPs and other notification requirements identified in applicable permits into project plans and specifications and/or contract documents. Incorporation of these requirements will protect sensitive natural resources and water quality from project impacts and ensure that the project will not jeopardize the continued existence of GGS species or result in the destruction of critical habitat. Suggested AMMs have been identified in the Biological Resources Assessment (BRA) and Biological Assessment (BA) prepared for the project.

Biological Resources MM-2 Northwestern Pond Turtle Avoidance and Minimization Measures

- Suitable aquatic habitat and upland nesting habitat is present within the BSA. If a northwestern pond turtle is observed in the project area during construction activities, project personnel will temporarily halt project activities until the turtle has moved itself to a safe location outside the limits of the project area, or the turtle will be relocated to suitable aquatic habitat within ¼ mile of the area. If project activities are to occur during the nesting season, (late June-July), a survey will be conducted by a qualified biologist to locate any northwestern pond turtles or their nests before project activities begin. This survey should be conducted no more than two days prior to the start of project activities. If a pond turtle nest is located, the biologist will flag the site and determine whether projects activities can avoid affecting the nest. If the nest cannot be avoided, a no-disturbance buffer zone will be established around the nest in coordination with CDFW. The no-disturbance buffer will remain in place until the young have left the nest.

Biological Resources MM-3 Migratory Birds and Nesting Raptors including Bald Eagle, Greater Sandhill Crane, Loggerhead Shrike, Merlin, Northern Harrier, Osprey, Song Sparrow and Tricolored Blackbird Avoidance and Minimization Measures

Vegetation removal or ground disturbance in areas where nests of birds protected by the MBTA (16 USC §703) and the CFGC (§3503) potentially occur, should be conducted between September 1 and February 28 (i.e. the non-breeding season). If vegetation removal or ground disturbance occurs during the breeding season (i.e. March 1 to August 31) then a qualified biologist shall:

- Conduct a survey for raptors and all other birds protected by the MBTA and map all nests located within 500 feet of construction areas. The survey should be conducted no more than two weeks prior to the start of project activities.
- Develop buffer zones around active nests that are sufficient enough in size to ensure impacts to nesting species are avoided. Project activities shall be prohibited within the buffer zone until young have fledged or the nest fails, as determined by a qualified biologist.

Biological Resources MM-4 Swainson’s Hawk Avoidance and Minimization Measures

Suitable nesting habitat is present within the BSA. Additionally, the species has been previously observed nesting in the BSA by representatives from CDFW. Project activities at individual locations will be minimal and generally restricted to the edges of the canals and the dirt roadway directly adjacent. These small areas in the context of the greater area do not provide the species with suitable foraging habitat as they will forage more readily in grassland, pasture, or fallowed agricultural fields before disturbed dirt roadway or canal banks.

- If feasible, construction activities should be conducted outside of the bird breeding season. (March 1-August 31). If work must occur during bird breeding season, to ensure that no indirect impacts to active nest occur due to any future construction activities, a qualified biologist will conduct a pre-construction survey for Swainson’s hawk and raptor nests. The area to be surveyed will include a 0.5-mile radius including and surrounding the BSA. If active nests are discovered, the District will be notified. No construction will occur until appropriate buffers are established, based upon recommendations by the qualified biologist. The pre-construction survey will be conducted no less than 14-days and no more than 30-days prior to commencement of construction. Should an active nest(s) be discovered, it will be monitored at reasonable intervals, as determined by a qualified biologist. The status of nesting activities shall be included in monthly reports to the District and/or regulatory agencies, as appropriate. Additionally, standard construction BMPs will be implemented which include returning disturbed areas to pre-construction condition which would include reseeded with an appropriate, approved seed mix.

4.5 Cultural Resources

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in California Code of Regulations, Section 15064.5?			X	
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to CA Code of Regulations, §15064.5?		X		
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?			X	

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
d) Disturb any human remains, including those interred outside of formal cemeteries?			X	

4.5.1 Setting

PAR Environmental Services, Inc. prepared a Cultural Resources Inventory and Evaluation in June 2019 for the proposed project. In support of the Cultural Resources Inventory, PAR staff conducted an archival record search, and a field survey to identify the cultural resources occurring, or potentially occurring, in the project area. The record search included a review of the data housed at the Northeast Information Center at CSU, Chico and a Sacred Lands search with the Native American Heritage Commission (NAHC). The field survey examined ten improvement sites with potential ground disturbing activities.

No archaeological resources were identified during the surveys of the ten improvement sites with potential ground disturbance. Four built environment resources which were comprised all of canal segments were recorded during the survey. The canals are earthen, u-shaped structures built in 1912 and 1924 by the Sutter Butte Canal Company. Three canals – the High Lift Lateral, Low Gravity Lateral, and the Watt Lateral meet the requirements of Criterion A for their role in irrigation, rice growing, and town growth. However, they have been altered from their 1912 appearance that they no longer retain integrity to their period of significance and are recommended as ineligible for inclusion in the National Register of Historic Places or California Register of Historic Resources as individual properties. No historic properties are located within the APE, and a Finding of No Historic Properties Affected is recommended for the Project.

4.5.2 Discussion

- a) **Less than Significant.** Archaeological field surveys were conducted by PAR on March 20, 2019, April 2019, and June 5, 2019 for identifying and recording archaeological resources. The field survey did not result in the identification of any prehistoric, archaeological, paleontological or proto-historic resources within the project site. Four built environment resources, all canals were recorded within the APE for the project. The canals are earthen lined with U-shaped profiles and are lined in various places with cobble, gravel, gunite, or asphalt chunks to prevent bank erosion. Canal lengths vary from 2.18 miles to 10.28 miles. The canals exhibit a variety of widths and depths. The canals were evaluated and recommended not eligible for inclusion in the NRHP, nor eligible for inclusion in the CRHR. These findings are based on a records search, consultation with interested parties and a field survey, conducted by a professional archaeologist.
- b) **Less than Significant With Mitigation Incorporated:** The proposed project would not generate potentially significant impacts to any known cultural resources as stated previously. However, in the event human remains are uncovered during work activities, pursuant to Health and Safety Code (§7050.5), the Coroner must be contacted if human remains are uncovered during construction activities (See item d below). Previously unidentified human remains are subject to regulations set forth at the state and federal levels, including the CA Public Resources Code and the Native American Graves Protection and Repatriation Act (NAGPRA). Incorporation of **Cultural Resources MM-1** will ensure impacts to archaeological resources would be less than significant.

- c) **Less than Significant.** The project footprints have been previously disturbed by the construction of the existing canal; access roads, and water conveyance structures, therefore, no paleontological resources are anticipated to be impacted.
- d) **Less than Significant.** While unlikely, there is the chance that currently unidentified remains could be uncovered during excavation. Per Health and Safety Code §7050.5, all work must cease and the County Coroner must be notified when previously unidentified human remains are discovered. No further disturbances may occur until the Coroner has made findings as to the origins and disposition per Public Resource Code §5097.98. Adherence to the applicable local, state and federal regulations ensures less than significant potential impacts to newly discovered human remains.

4.5.3 Mitigation:

Cultural Resources MM-1

Although no prehistoric sites have been formally recorded or otherwise identified within the project site, the presence of buried cultural resources is always a possibility. Therefore, although unlikely, if unknown resources are discovered during construction and excavation activities, the following Cultural Resources Minimization Measures will be included in all contract documents and construction plans.

- Should archaeological resources be encountered at any point during project excavation and construction activities, all activity around the discovery will cease. The District will retain the services of a qualified archaeologist to examine the findings, assess their significance, and offer proposals for any exploratory procedures deemed appropriate to further investigate and/or mitigate any adverse impacts.
- Should human remains be encountered during excavation activities in the project area, the following procedures shall be followed:
 - Per Health and Safety Code §7050.5(b), the Sutter County Coroner’s Office will be contacted immediately; all work must cease, no further disturbances may occur until the Coroner has made findings as to the origins and disposition per Public Resources Code §5097.98.
 - If the Coroner determines the remains are Native American, the Office will notify the Native American Heritage Commission (NAHC) within 24 hours.
 - Following receipt of the Coroners notice, the NAHC will contact a Most Likely Descendent (MLD). The MLD will then have 48 hours in which to make recommendations to the County and the consulting archaeologist regarding the treatment and/or re-interment of the human remains and any associated grave items.

4.6 Energy

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?			X	
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?				X

4.6.1 Discussion

- a) **Less than Significant.** The proposed project will not result in any potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation. Construction energy consumption would largely occur from fuel consumption by equipment during project construction, transportation of materials to and from the site, and construction worker trips to and from the project site. Energy consumption during construction related activities would vary substantially depending on the level of activities, length of construction period, construction operations, type of equipment used, and number of personnel present. Despite this variability, the overall scope of construction is minor due to the short time period construction would take place at each site. Increasingly stringent state and federal regulations regarding engine efficiency combined with state, local, and federal regulations limiting engine idling times and recycling of construction debris, would further reduce the amount of transportation fuel demand during construction.
- b) **Less than Significant.** Many of the state and federal regulations regarding energy efficiency focus on increasing building efficiency and renewable energy generation, as well as reducing water consumption and vehicle miles traveled. The proposed project includes conservation measures to meet or exceed the regulatory requirements including limiting idling time of equipment during construction activities. The project will comply with BCAQMD standards regarding engine efficiency and limiting idling time during project construction. Additionally, the project involves improvements to water infrastructure that will aid in the conservation of water resources.

4.6.2 Mitigation: *None Required*

4.7 Geology and Soils

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i.) Rupture of a known earthquake fault, as delineated on the Alquist-Priolo Earthquake Fault Zoning Map for the area or based on other substantial evidence of a known fault?				X
ii.) Strong seismic ground shaking?				X
iii.) Seismic-related ground failure/liquefaction?				X
iv.) Landslides?				X
b) Substantial soil erosion or the loss of topsoil?			X	
c) Located on a geologic unit or soil that is unstable, or would become unstable as a result of the project, and potentially result in landslide, lateral spreading, subsidence, liquefaction or collapse?				X
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				X

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				X

4.7.1 Discussion

- a) **No Impact.** The site is not located in an Alquist-Priolo Earthquake fault zone, there are no known active faults underlying, or adjacent to, the project site. The Cleveland Hill fault is located approximately 15 miles southeast of the project site. Because the nearest active fault is located a considerable distance from the project site, the likelihood of a surface rupture at the project site is very low, and would not be a design consideration.

Ground shaking at the project site could occur due to the earthquake potential of the region’s active faults. However, active faults are relatively distant from the project site. As a result, ground shaking due to seismic events is expected to have low intensities at the project site. The California Building Code (CBC) would provide minimum standards to safeguard life or limb, health, property and public welfare by regulating the controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of buildings and structures within Butte County. Among the provisions of the CBC are building design criteria for earthquake conditions in Butte County. Adherence to the CBC during building construction would ensure that potential impacts are less than significant.

The project site is identified as being located within an area considered “Generally Moderate” in respect to liquefaction potential. The CBC regulates the construction of structures, which may be constructed with approval of the proposed project. Adherence to CBC standards at the time of construction of the project ensure that any impacts from an unstable geologic unit or soil are less than significant.

The project area is primarily level with 0-2% slopes. As a result, the landslide potential for the project site and surrounding area is very low. Though the potential for landslides are generally low, shallow slope failures can occur in virtually any sloping terrain during construction activities. Avoidance of potentially sensitive slopes and/or implementation of appropriate engineering and construction measures at the time of project construction would avoid or reduce potential impacts of landslides to a less than significant level.

- b) **Less than Significant.** The project is the replacement of structurally deficient water control structures. During construction-related activities, specific erosion control and surface water protection methods would be implemented within the project site such as straw wattles and silt fencing, and the use of erosion control seeding. The potential water control upgrades are primarily within areas that have been previously disturbed and graded. However, since construction will disturb one or more acres of land activities would be subject to the National Pollutant Discharge Elimination System (NPDES) General Construction Activities Stormwater permit program. This program requires implementation of erosion BMPs during and immediately after construction that are designed to avoid significant erosion. In addition, project operations would be subject to State Water Resources Control Board requirements for the preparation and implementation of a project specific Stormwater Pollution Prevention Plan (SWPPP) to control pollution in stormwater runoff from the project site, which includes excessive erosion and sedimentation. The SWPPP would need to be obtained prior to any soil disturbing activities. The implementation of standard erosion control BMPs during future

construction activities and adherence to State requirements would ensure potential erosion impacts are less than significant.

- c) **No Impact.** The project is the replacement of structurally deficient water control structures. During construction-related activities, specific erosion control and surface water protection methods would be implemented within the project site such as straw wattles and silt fencing, and the use of erosion control seeding. The potential water control upgrades are primarily within areas that have been previously disturbed and graded. However, since construction will disturb one or more acres of land activities would be subject to the National Pollutant Discharge Elimination System (NPDES) General Construction Activities Stormwater permit program. This program requires implementation of erosion control measures during and immediately after construction that are designed to avoid significant erosion. In addition, project operations would be subject to State Water Resources Control Board requirements for the preparation and implementation of a project specific Stormwater Pollution Prevention Plan (SWPPP) to control pollution in stormwater runoff from the project site, which includes excessive erosion and sedimentation. The SWPPP would need to be obtained prior to any soil disturbing activities. The implementation of standard erosion control best management practices (BMPs) during future construction activities and adherence to State requirements would ensure potential erosion impacts are less than significant.
- d) **Less than Significant.** A number of soil types are present within the project area and are typically clay loams 0-2 percent slopes, this soil type has moderate shrink swell potential. However, all design and construction will comply with the California Building Code requirements.
- e) **No Impact.** The project will not utilize septic tanks or an alternative wastewater disposal system on the site. Therefore, the proposed project will not result in an impact due to soils incapable of adequately supporting septic systems.

4.7.2 Mitigation: *None required.*

4.8 Greenhouse Gas Emissions

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Generate greenhouse gas emissions, directly or indirectly, that may have a significant impact on the environment?			X	
b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?			X	

4.8.1 Setting

The Butte County Climate Action Plan (CAP) was adopted on February 25, 2014. The CAP provides a framework for the County to reduce GHG emissions while simplifying the review process for new development. Measures and actions identified in the CAP lay the groundwork to achieve the adopted General Plan goals related to climate change, including reducing GHG emissions to 1990 levels by 2020.

A 2006 baseline GHG emission inventory was prepared for unincorporated Butte County. The inventory identified the sources and the amount of GHG emissions produced in the county. Within Butte County, the

leading contributors of GHG emissions are agriculture (43%), transportation (29%), and residential energy (17%).

New projects are evaluated to determine consistency with the CAP and to identify which GHG emission measures would be implemented with project approval. These measures may include reduction of construction equipment idling time.

4.8.2 Discussion

- a) **Less than Significant.** It is anticipated that water control infrastructure replacement activities would generate short-term temporary GHG emissions associated with construction equipment. The BMP's discussed in Section 3, Air Quality, minimize temporary emissions associated with the construction activities.
- b) **Less than Significant.** Although development of the project will result in temporary construction related GHG emissions, the project will implement measures from the BCAQMD that limit construction idling time. As such, the project will not conflict with the County's CAP nor would it conflict with any other identified plans, policies, or regulations adopted for the reduction of greenhouse gas emissions.

4.8.3 **Mitigation:** *None required.*

4.9 Hazards and Hazardous Materials

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			X	
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?			X	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X
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 for people residing or working in the project area?				X

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			X	
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				X

4.9.1 Discussion

- a) **Less than Significant.** The proposed project would not involve the routine transport, use, or disposal of hazardous materials, and would not result in such impact. Construction activities associated with the project would include refueling and minor onsite maintenance of construction equipment, which could lead to minor fuel or oil spills. The use and handling of hazardous materials during construction activities would occur in accordance with applicable federal, state, and local laws including California Occupational Health and Safety Administration (CalOSHA) requirements. It is not anticipated that large quantities of hazardous materials would be permanently stored or used within the project site. However, if large quantities are stored at the project site, the owner would be required to obtain a Hazardous Materials Business Plan. As previously mentioned, it is more likely small quantities of publicly available materials would be utilized during project construction. These materials would not be used in sufficient quantity or strength to create a substantial risk of fire or explosion, or otherwise pose a substantial risk to human or environmental health.
- b) **Less than Significant.** The proposed project would not result in new land uses when compared to existing conditions. The project would not construct dwellings, occupy structures, or result in land uses that could generate or emit hazardous materials. Project activities are not anticipated to result in a release of hazardous materials into the environment, or to create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions. Additionally, the project will comply with the BCAQMD rules and regulations.
- c) **No Impact.** The proposed project does not involve any emission or handling of any hazardous materials, substances, or waste within one-quarter mile of an existing school. No existing or proposed school facilities are located within a one-quarter mile radius of the project site.
- d) **No Impact.** The project is not included on a list of sites containing hazardous materials, and would not result in a significant hazard to the public or to the environment. The project site is not included on the Cortese list compiled pursuant to Government Code Section 65962.5. The nearest identified site containing hazardous materials is an evaluation site located south of Highway 162 near Highway 99 and the Thermalito Afterbay. The site is approximately 3.5 miles from the nearest project work site.
- e) **Less than Significant.** The proposed project site is not located within two miles of a public airport. The nearest public airport is the Oroville Airport located approximately 5.00 miles northeast of the project area.

- f) **No Impact.** The proposed project site is located approximately three miles north of a small private agricultural airstrip, however, the project would not result in permanent structures that expose people to a safety hazard.
- g) **Less than Significant.** The proposed project does not include any actions within the roadways that would physically interfere with any emergency response or emergency evacuation plans. The project would not result in an increase in traffic, and thus would not significantly reduce the current level of service of the area road network.
- h) **Less than Significant.** The proposed project is located in an area used for agricultural and residential purposes, and is not in the Sutter Buttes or river bottom wildland areas that can be susceptible to wildland fires. Therefore, the proposed project will not expose people or structures to a significant risk of loss, injury, or death involving wildfires.

Mitigation: None required.

4.10 Hydrology and Water Quality

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Violate any water quality standards or waste discharge requirements?			X	
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				X
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?				X
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?			X	
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?			X	
f) Otherwise degrade water quality?				X

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?				X
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				X
j) Inundation by seiche, tsunami, or mudflow?				X

4.10.1 Discussion

- a) **Less Than Significant.** As identified in Section 4.4 of this document (Biological Resources), the project will obtain all appropriate regulatory permits including certification from a RWQCB per Section 401 Water Quality Certification of the Clean Water Act prior to construction activities. Additionally, the project would be required to implement all applicable erosion control BMPs as a condition of RWQCB approval, which include: the installation of straw wattles, and silt fencing, etc. to prevent silt/sediment from entering the water, and re-seeding of disturbed upland areas post construction. As described in the Biological Resources Section of this document (Section 4.4), the project will be required to adhere to the requirements Section 401 of the Clean Water Act, and Section 1600 of the CA Fish and Game Code, as well as the air quality standard mitigation measures for fugitive dust control outlined in Section 4.3, **Air Quality MM-1**. A Section 401 permit is contingent on sufficient evidence that a project would not pose a threat to water quality or quantity leaving the proposed project’s site. No additional mitigation measures are necessary.
- b) **No Impact.** The proposed project involves the replacement of water control devices along the District’s canals and does not propose activities requiring permanent increases in groundwater use. No new extraction wells or buildings with the potential to increase water usage are proposed.
- c) **Less Than Significant.** Project activities include the replacement of water control structures. The overall direction of drainage on the site will not change. The implementation of standard erosion control measures and BMPs during construction activities will minimize soil erosion and siltation. Additionally, the proposed project will not alter the existing drainage pattern of the site, including through the alteration of the course of the District’s canals in a manner that will result in substantial erosion or siltation on- or off-site
- d) **Less than Significant.** The proposed project involves the replacement of water control infrastructure. These devices are already present within the District’s canal system and they are being replaced to bring them to modern standards. The placement of the new replacement structures will not alter the existing drainage pattern of the site. Additionally, the project will not result in an increase in runoff rate which would result in flooding on- or off-site.
- e)-j) **No Impact.** The proposed project would not result in significant increases in the surface area of impervious materials, or redirect flood flows. The proposed project is located within several map boundaries (FIRM Map Numbers 06007C0950E, 06007C0975E, 06007C0745e, and 06007C0765E),

the project does not involve the construction of dwelling units and will not place housing within the flood hazard area. Furthermore, the project would not expose people or structures to significant loss, injury, or death involving flooding, including levee or dam failure. There are no anticipated impacts to the proposed project from seiche, tsunami, or mudflow, as no topographical features of water bodies capable of producing such events exist within the project site vicinity.

4.10.2 Mitigation: *None Required*

4.11 Land Use and Planning

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

4.11.1 Discussion

a), b) **No impact.** The project involves the replacement of water control structures and will not physically divide an established community. The proposed project would not conflict with an applicable land use plan, policy, or regulation of any agencies with jurisdiction adopted for the purpose of avoiding or mitigating an environmental effect.

c) **No Impact.** The project will not have a substantial conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. The project site is located within the boundaries of the proposed Butte Regional Conservation Plan (BRCP). The BRCP has not been completed or adopted at this time; therefore, no impact is anticipated.

4.11.2 Mitigation: *None required.*

4.12 Mineral Resources

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X
b) Result in the loss of availability of a locally-important mineral resource recovery site on a local general plan, specific plan or other land use plan?				X

4.12.1 Discussion

a), b) No Impact. The California Geological Survey’s (Department of Conservation) map “Fifty-Year Aggregate Demand Compared to Permitted Aggregate Resources” (2012) does not identify extraction facilities near the project site. The General Plan and State of California Division of Mines and Geology Special Publication 132 do not list the site as having any substantial mineral deposits of a significant or substantial nature. Relative to mineral resources, there would be no impact

4.12.2 Mitigation: *None required*

4.13 Noise

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X	
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?			X	
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			X	
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			X	
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 expose people residing or working in the project area to excessive noise levels?				X
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X

4.13.1 Discussion

a)-d) Less Than Significant. The project is consistent with the Butte County General Plan, Noise Element (Butte County 2010). The nearest residences (sensitive receptor) are located adjacent to portions of the District’s water conveyances near Richvale. There are homes within 1000 feet of the project work limits and individual project sites. The Butte County Noise Ordinance states that construction noise within 1,000 feet of noise-sensitive uses (i.e., residential uses, daycares, schools, convalescent homes, and medical care facilities) is limited to daytime hours between sunrise to sunset on weekdays and non-holidays, 8:00 am and 6:00 pm on Saturdays and holidays, and Sundays between 10:00 a.m. to 6:00 p.m. No adverse noise impacts from construction are anticipated because construction would be conducted in accordance with applicable local noise standards discussed above. Increases in noise is limited to temporary, intermittent construction noise in the immediate project area. The proposed project would not alter land use or traffic, and thus would not increase the ambient noise within the area. Construction activities are limited to the hours allowed by the County Ordinance. No permanent increase in ambient noise will take place due to the

project. Noise impacts will take place during the construction period and they will be temporary and limited to daytime hours as stated above. No mitigation measures are necessary.

- e) **Less than Significant:** The proposed project is not located within an airport land use plan area and is located approximately 5.00 miles from the Oroville Airport. The proposed project will not expose people residing or working in the project area to excessive noise levels. A less than significant impact is anticipated.
- f) **No Impact:** The proposed project is not located within two miles of a private airstrip and people residing or working in the project area will not be exposed to excessive noise levels generated by private airstrips.

4.13.2 Mitigation: *None Required*

4.14 Population and Housing

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				X
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X

4.14.1 Discussion

a)-c) **No Impact:** The proposed project is a water delivery infrastructure replacement project located in a relatively rural portion of Butte County. The proposed project will not induce substantial population growth in the area, directly or indirectly, or displace a substantial number of people or existing housing. The project will not displace people or housing nor necessitate the construction of replacement housing elsewhere. Therefore, the project will not impact population or housing.

4.14.2 Mitigation: *None required*

4.15 Public Services

Would the project: 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:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Fire protection?				X

Would the project: 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:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
b) Police protection?				X
c) Schools?				X
d) Parks?				X
e) Other public facilities?				X

4.15.1 Discussion

a)-e) No Impact. The proposed project would not construct buildings, businesses or other facilities that would result in an increased population in the area. There would be no long-term demands on public services such as fire protection, police protection, schools, or parks generated by this project. No changes in fire protection or police protection are proposed as part of this project. Therefore, the proposed project is not anticipated to impact public services.

4.15.2 Mitigation: *None required*

4.16 Recreation

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
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?				X
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?				X

4.16.1 Discussion

a), b) No Impact. The proposed project will not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility will occur or be accelerated nor will the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. This proposed project will not result in residential development. There are no existing neighborhoods or regional parks in the vicinity of the project site and the project does not proposed recreational facilities or require the expansion of existing recreational facilities; therefore, no impacts are anticipated.

4.16.2 Mitigation: *None required*

4.17 Traffic and Transportation

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?				X
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?				X
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X
e) Result in inadequate emergency access?			X	
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?				X

4.17.1 Discussion

- a) **No Impact.** The proposed project is a water control infrastructure modernization project and will not conflict with an applicable plan, ordinance or policy regarding the effectiveness of the performance of the circulation system. The proposed project would not generate additional traffic, as it would not construct facilities that would generate additional vehicular traffic such as a retail center or residential subdivision.

- b) **No Impact.** The project is not expected to result in additional vehicular trips, or to impact levels of service and trip distributions within the project area. The proposed project will not conflict with an applicable congestion management program and will not affect travel demand measures. The proposed project would generate less than significant impacts to traffic and transportation.

- c) **No Impact.** The proposed project will not result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that will result in substantial safety risks. The project site is not located in the vicinity of a public airport which is approximately 5.00 miles northeast of the project area. This project will not obstruct air traffic patterns. As a result, no impact is anticipated.
- d) **No Impact.** The proposed project would replace water control structures within the District’s canals. The proposed project will not increase hazards due to a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment). No impacts are anticipated.
- e) **No Impact.** The project will be required to adhere to pertinent local and state construction site regulations. Thus, temporary traffic control activities during the construction phase of the proposed project would not prevent emergency vehicle movement throughout the area. The proposed improvements, which would bring the existing facilities in the project site up to current design standards, would provide safer passage for emergency vehicles. Therefore, relative to emergency access, impacts would be less than significant.
- f) **No Impact.** The proposed project will not conflict with an applicable plan, ordinance or policy regarding public transit, bicycle or pedestrian facilities because the project site is located in a rural area that does not have any provisions for alternative transportation. No impact is anticipated.

4.17.2 Mitigation: *None required*

4.18 Tribal Cultural Resources

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 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:			X	
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			X	
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 Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe			X	

4.18.1 Discussion

- a) **Less than Significant.** As part of the ASR prepared for the project by the PAR, a sacred lands file request with the NAHC and Native American Consultation with the identified tribes was conducted. An NAHC search of the Sacred Lands File came back negative for tribal cultural resources within the APE. The Bureau of Reclamation under Section 106 is responsible for Tribal Consultation.

4.19 Utilities and Service Systems

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Exceed wastewater treatment requirements of the applicable Water Quality Control Board?				X
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				X
e) Result in a determination by the wastewater treatment provider which serves/may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				X
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?				X
g) Comply with federal, state, and local statutes and regulations related to solid waste?				X

4.19.1 Discussion

a)-e) **No Impact.** This project proposes replacing existing water delivery infrastructure, with new modern structures similar to the existing. The new modern water delivery infrastructure will not significantly increase the amount of impervious surfaces in the area, and will not increase the surface runoff of the area. The project will not require additional water supplies or entitlements. The project will not result in exceeding wastewater treatment requirements for the applicable RWQCB or result in the need for new wastewater treatment facilities because the project is not a use that generates wastewater.

f), g) **No Impact.** The proposed project would not generate impacts relative to landfill capacity, wastewater treatment or solid waste generation. Therefore, there would be no impact.

4.19.2 Mitigation: *None required*

4.20 Wildfire

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?				X
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?				X
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?				X
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?				X

4.20.1 Setting

The project site has not been designated as a fire hazard by the State Department of Forestry and Fire Protection. The project site is also within a designated Federal or Local Responsibility Area (LRA), which means the local jurisdiction has fiscal responsibility for preventing and suppressing wildfires.

4.20.2 Discussion

- a) **No Impact.** The project improvement sites are located along the District’s canals and are accessed via access routes along the canal top. The project will not impair an adopted emergency response plan or evacuation plan.
- b) **No Impact.** The project site is located in the Central Valley and as such the topography of the site is flat to gently sloping and will not expose project occupants to pollution concentrations from a wildfire. Additionally, the project is in an area surrounded by rice agriculture that typically holds water. Fires in the area are limited in size and contained quickly due to the conditions in the area. No conditions or factors have been identified in the project area that would exacerbate wildfire risks
- c) **No Impact.** The proposed project involves improvements to water control structures. The project does not involve the construction of infrastructure that would exacerbate fire risk. Due to the existing conditions of the site project construction would not exacerbate a fire risk.
- d) **No Impact.** The proposed project is located within the Central Valley that contains slopes between 0 and 2 percent. The project area does not exhibit landslide potential, therefore, no impacts from post fire instability or drainage changes have been identified.

4.20.3 Mitigation: *None Required*

Page Intentionally Left Blank.

5 Mandatory Findings of Significance

Mandatory Findings of Significance	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		X		
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)?				X
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?				X

5.1.1 Discussion

- a) **Less Than Significant with Mitigation Incorporated.** With the implementation of the mitigation measures included in this Initial Study, **Air Quality MM-1, Biological Resources MM-1 through MM-4 and Cultural Resources MM-1**, the proposed project would not degrade the environment; result in an adverse impact on fish, wildlife, or plant species including special status species, or prehistoric or historic resources.

- b) **No Impact.** The project is the replacement of water control structures within the Richvale Irrigation District. The project does not involve the addition of new expanded structures, facilities, or growth inducing effects, which would be considered cumulatively considerable with regards to past or future projects.

- c) **No Impact.** Based on the preceding environmental analysis and adherence to applicable local, state and federal regulations, as noted in this document, the proposed project would not result in potentially significant cumulative, direct or indirect adverse effects on human beings.

6 Preparers and References

6.1 Report Preparation and Review

Kamie Loeser, Principal Planner, NorthStar, Preparer/Reviewer

Matt Rogers, Associate Environmental Planner/ Biologist, NorthStar, Preparer

6.2 References

Baldwin, B.G., D.H Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken, editors. 2012. *The Jepson Manual: Vascular Plants of California, Second Edition*. University of California Press, Berkeley, CA.

Butte County Association of Governments. *Butte Regional Conservation Plan, Formal Public Draft*. Available at www.buttehcp.com/BRCP-Documents/Formal-Public-Draft_BRCP/index.html

Butte County. 2014. *Butte County Climate Action Plan*. Oroville, CA. February 25, 2014. Available at www.buttecap.net

Butte County. 2010. *Butte County 2030 General Plan and Environmental Impact Report*. Butte County, CA

Butte County Air Quality Management District. 2014. *CEQA Air Quality Handbook*. October 2014.

Butte County. 2000. *Butte County Airport Land Use Compatibility Plan*. Butte County Land Use Commission. Adopted December 2000.

California Department of Conservation. *Fault-Rupture Hazard Zones in California. Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zone Maps*. Special Publication 42. Interim Revision. 2007.

California Department of Conservation. *Fault Activity Map of California Map*. Accessed August 2018. Available at: maps.conservation.ca.gov/cgs/fam/

California Department of Conservation. *California Important Farmland Finder*. Accessed August 2018. Available at: maps.conservation.ca.gov/ciff/ciff.html

California Department of Conservation. 2012. *Fifty-Year Aggregate Demand Compared to Permitted Aggregate Reserves*. Available at www.conservation.ca.gov/cgs/information/publications/ms/Documents/MS_52_2012.pdf

California Department of Toxic Substance Control. 2009. *Envirostor Database*. Accessed August 2018. Available at: <http://www.envirostor.dtsc.ca.gov/public>

Federal Emergency Management Agency. 2016. *FEMA Flood Map Service Center*. Accessed September 2018. Maps 06007C0975E, 06007C0950E, 06007C0745E, 06007C0765E. Available at: <https://msc.fema.gov/portal>

Northern California Water Association. 2014. *Feather River Regional Agricultural Water Management Plan*.

NorthStar. 2019. *Biological Resources Assessment*.

NorthStar. 2019. *Biological Assessment*.

PAR Environmental Services, Inc. 2019. *Cultural Resources Inventory and Evaluation for The Biggs-West Gridley Water District On-Farm Delivery Management Program, Butte County, California*.

Public Resources Code, California (as amended). *California Environmental Quality Act. Division 13, §21000 et seq.* Sacramento, CA

Regulations, Code of (CA) (as amended). *Title 14, Division 6, §15000 et seq. Guidelines for California Environmental Quality Act.* Sacramento, CA

State Water Resources Control Board. *Geotracker Database.* Available at <https://geotracker.waterboards.ca.gov>

Swaim Biological, Inc. 2019. *Giant Garter Snake Habitat Assessment for the Richvale Irrigation District On Farm Delivery Management Program.*

Western Regional Climate Center. 2018. *Marysville, California, Period of Record General Climate Summary-Temperature and Precipitation, Station (0445385) MARYSVILLE, From Year=1897 to Year=2007.*

U.S. Department of Agriculture. 2019. *Web Soil Survey.* Available online at: websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

7 Acronyms and Abbreviations

Agencies, Boards, Commissions, Districts:

BCAQMD	Butte County Air Quality Management District
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
CDFW	California Department of Fish and Wildlife
CDWR	California Department of Water Resources
DTSC	(California) Department of Toxic Substances Control
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
NAHC	Native American Heritage Commission
NSVAB	Northern Sacramento Valley Air Board
RWQCB	Regional Water Quality Control Board
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

Guidelines, Policies, Programs, Regulations:

CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CWA	Clean Water Act
ESA	Endangered Species Act
FGC	Fish and Game Code
MBTA	Migratory Bird Treaty Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NPDES	National Pollution Discharge Elimination System
NRHP	National Registry of Historic Places
SIP	State Implementation Plan

Miscellaneous:

APE	Area of Potential Effect
ASR	Archaeological Survey Report
BA	Biological Assessment
BMPs	Best Management Practices
BRA	Biological Resources Assessment
BSA	Biological Study Area
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	Carbon Monoxide
District	Richvale Irrigation District
ESAs	Environmentally Sensitive Areas
FIRM	Flood Insurance Rate Map
GGS	Giant Garter Snake
GHG	Greenhouse Gases
MLD	Most Likely Descendant
NOx	Nitrogen oxides

PM_{10 / 2.5}Particulate Matter less than 10 / 2.5 Microns
ROG Reactive Organic Gases
RPWRelatively Permanent Waters

8 Mitigation Monitoring and Reporting Program

MM No.	Mitigation Measure	Timeframe for Implementation	Responsible Monitoring Agency	Verification of Compliance		
				Agency & Initials	Date	Notes
AIR QUALITY						
Air Quality MM-1	<p>The following best practice measures to reduce impacts to air quality will be incorporated into the project during construction. These measures are intended to reduce criteria air pollutants that may originate from the site during the course of construction operations.</p> <p><u>Diesel PM Exhaust from Construction Equipment and Commercial On-Road Vehicles Greater than 10,000 Pounds</u></p> <ul style="list-style-type: none"> All on- and off-road equipment shall not idle for more than five minutes. Signs shall be posted in the designated queuing areas and/or job sites to remind drivers and operators of the five-minute idling limit. Idling, staging and queuing of diesel equipment within 1,000 feet of sensitive receptors is prohibited. All construction equipment shall be maintained in proper tune according to the manufacturer's specifications. Equipment must be checked by a certified mechanic and determined to be running in proper condition before the start of work. Install diesel particulate filters or implement other CARB-verified diesel emission control strategies. Shall not operate a diesel-fueled auxiliary power system (APS) to power a heater, air conditioner, or any ancillary equipment on that vehicle during sleeping or resting in a sleeper berth for greater than 5 minutes at any location when within 100 feet of a restricted areas. To the extent feasible, truck trips shall be scheduled during non-peak hours to reduce peak hour emissions. 	Fugitive Dust Control Plan - Prior to initiation of construction.	Richvale Irrigation District			

MM No.	Mitigation Measure	Timeframe for Implementation	Responsible Monitoring Agency	Verification of Compliance		
				Agency & Initials	Date	Notes
	<p><u>Fugitive Dust</u></p> <p>Construction activities can generate fugitive dust that can be a nuisance to local residents and businesses near a construction site. Dust complaints could result in a violation of the District’s “Nuisance” and “Fugitive Dust” Rules 200 and 205, respectively. The following is a list of measures that may be required throughout the duration of the construction activities:</p> <ul style="list-style-type: none"> • Reduce the amount of the disturbed area where possible. • Use of water trucks or sprinkler systems in sufficient quantities to prevent airborne dust from leaving the site. An adequate water supply source must be identified. Increased watering frequency would be required whenever wind speeds exceed 15 mph. Reclaimed (non-potable) water should be used whenever possible. • All dirt stockpile areas should be sprayed daily as needed, covered, or a District approved alternative method will be used. • Permanent dust control measures identified in the approved project revegetation and landscape plans should be implemented as soon as possible following completion of any soil disturbing activities. • Exposed ground areas that will be reworked at dates greater than one month after initial grading should be sown with a fast-germinating non-invasive grass seed and watered until vegetation is established. • All disturbed soil areas not subject to re-vegetation should be stabilized using approved chemical soil binders, jute netting, or other methods approved in advance by the Butte County Air Quality Management District. • Vehicle speed for all construction vehicles shall not exceed 15 mph on any unpaved surface at the construction site. • All trucks hauling dirt, sand, soil, or other loose materials are to be covered or should maintain at least two feet of 					

MM No.	Mitigation Measure	Timeframe for Implementation	Responsible Monitoring Agency	Verification of Compliance		
				Agency & Initials	Date	Notes
	<p>freeboard (minimum vertical distance between top of load and top of trailer) in accordance with local regulations.</p> <ul style="list-style-type: none"> • Install wheel washers where vehicles enter and exit unpaved roads onto streets, or wash off trucks and equipment leaving the site. • Sweep streets at the end of each day if visible soil material is carried onto adjacent paved roads. Water sweepers with reclaimed water should be used where feasible. • Post a sign in prominent location visible to the public with the telephone numbers of the contractor and the Butte County Air Quality Management District - (530) 332-9400 for any questions or concerns about dust from the project.” <p>All fugitive dust mitigation measures required should be shown on grading and building plans. In addition, the contractor or builder should designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite. Their duties shall include holidays and weekend period when work may not be in progress. The name and telephone number of such persons shall be provided to the District prior to land use clearance for map recordation and finished grading of the area.</p> <p>Please note that violations of District Regulations are enforceable under the provisions of California Health and Safety Code Section 42400, which provides for civil or criminal penalties of up to \$25,000 per violation.</p> <ul style="list-style-type: none"> • 					
BIOLOGICAL RESOURCES						
	<p>Biological Resources MM-1 Obtain Regulatory Permits and Implement Avoidance and Minimization Measures</p> <ul style="list-style-type: none"> • The project will obtain the following permits, as necessary and applicable: <ul style="list-style-type: none"> ○ USFWS Section 7 ESA Informal Consultation ○ F.G.C. Section 1602 Streambed Alteration 	<p>Obtain Permits - Prior to initiation of construction.</p> <p>Purchase Compensatory Mitigation (if applicable) – Prior</p>	Richvale Irrigation District			

MM No.	Mitigation Measure	Timeframe for Implementation	Responsible Monitoring Agency	Verification of Compliance		
				Agency & Initials	Date	Notes
	<p>Agreement from CDFW</p> <ul style="list-style-type: none"> ○ F.G.C. Section 2080.1 Notification and Consistency Determination from CDFW • Given the GGS habitat located within the project boundaries, the purchase of compensatory mitigation will likely be required by USFWS and/or CDFW. If the purchase of mitigation credits is deemed applicable and necessary by USFWS and/or CDFW during the ESA Section 7 consultation process and/or Fish and Game Code Section 2080.1 consistency determination process, the District shall purchase compensatory mitigation for permanent loss of suitable aquatic and upland habitat for GGS. Mitigation credits would be purchased at the ratio identified by USFWS and/or CDFW. If mitigation credits for permanent impacts to GGS habitat are required, then the following compensatory mitigation is proposed: Temporarily impacted habitat along the canal is anticipated to readily reestablish following construction activities. Additionally, to hasten revegetation, upland areas adjacent to the canals will be hydroseeded with a mixture of native species to promote reestablishment of bankside vegetation. Once construction is completed and pre-construction conditions (topography and hydrology) are reestablished they should revert to pre-construction vegetation character within a few months to a year following completion of project activities. <p>Several improvement types including Types 1, 2, 8, and spills were considered low impact due to their small nature, shallow depth of excavation, and likelihood for timely restoration. Therefore, the following mitigation is proposed for work in the active and inactive season.</p> <p>If work is to occur during the GGS active season the low impact sites (Types 1, 2, 8, and spills) totaling 0.222 acres of temporary impact will be restored and returned to pre-construction conditions. All other sites totaling 0.549 acres of temporary impact will be mitigated at a ratio of 0.5:1 for a total compensation for temporary impacts of 0.27 acres. Permanent impacts totaling 0.06 acres will be mitigated at a ratio of 3:1 for a total compensation for permanent impacts of 0.18 acres. The total</p>	<p>to initiation of construction.</p> <p>AMMs – Include in specifications and contract documents.</p>				

MM No.	Mitigation Measure	Timeframe for Implementation	Responsible Monitoring Agency	Verification of Compliance		
				Agency & Initials	Date	Notes
	<p>number of acres (temporary impact and permanent impact) of mitigation would be 0.45 acres.</p> <p>If work is to occur during the GGS inactive season, temporary impacts at the low impact sites (Types 1, 2, 8, and spills) would be mitigated at a ratio of 0.5:1 for a compensation acreage of 0.111. Temporary impacts at all other sites would be mitigated at a 1:1 ratio for a compensation acreage of 0.549 acres. Permanent impacts would be mitigated at a 4:1 ratio for a compensation acreage of 0.24 acres. The total compensation for temporary and permanent impacts during inactive season construction would be 0.9 acres. The following table summarizes the proposed mitigation for the project.</p> <p>The project will incorporate the avoidance and minimization measures (AMMs), standard BMPs and other notification requirements identified in applicable permits into project plans and specifications and/or contract documents. Incorporation of these requirements will protect sensitive natural resources and water quality from project impacts and ensure that the project will not jeopardize the continued existence of GGS species or result in the destruction of critical habitat. Suggested AMMs have been identified in the Biological Resources Assessment (BRA) and Biological Assessment (BA) prepared for the project.</p>					
	<p>Biological Resources MM-2 Northwestern Pond Turtle Avoidance and Minimization Measures</p> <ul style="list-style-type: none"> Suitable aquatic habitat and upland nesting habitat is present within the BSA. If a northwestern pond turtle is observed in the project area during construction activities, project personnel will temporarily halt project activities until the turtle has moved itself to a safe location outside the limits of the project area, or the turtle will be relocated to suitable aquatic habitat within ¼ mile of the area. If project activities are to occur during the nesting season, (late June-July), a survey will be conducted by a qualified biologist to locate any northwestern pond turtles or their nests before project activities begin. This survey should be conducted no more than two days prior to the start of project activities. If a pond turtle nest is located, the biologist will flag the site and determine whether projects activities can avoid affecting the nest. If the nest cannot be avoided, a no-disturbance buffer zone will be 	Prior to initiation of construction.	Richvale Irrigation District			

MM No.	Mitigation Measure	Timeframe for Implementation	Responsible Monitoring Agency	Verification of Compliance		
				Agency & Initials	Date	Notes
	established around the nest in coordination with CDFW. The no-disturbance buffer will remain in place until the young have left the nest					
	<p>Biological Resources MM-3 Migratory Birds and Nesting Raptors including Bald Eagle, Greater Sandhill Crane, Loggerhead Shrike, Merlin, Northern Harrier, Osprey, Song Sparrow (Modesto Population) and Tricolored Blackbird Avoidance and Minimization Measures</p> <p>Vegetation removal or ground disturbance in areas where nests of birds protected by the MBTA (16 USC §703) and the CFGC (§3503) potentially occur, should be conducted between September 1 and February 28 (i.e. the non-breeding season). If vegetation removal or ground disturbance occurs during the breeding season (i.e. March 1 to August 31) then a qualified biologist shall:</p> <ul style="list-style-type: none"> • Conduct a survey for raptors and all other birds protected by the MBTA and map all nests located within 500 feet of construction areas. The survey should be conducted no more than two weeks prior to the start of project activities. ○ Develop buffer zones around active nests that are sufficient enough in size to ensure impacts to nesting species are avoided. Project activities shall be prohibited within the buffer zone until young have fledged or the nest fails, as determined by a qualified biologist 	Prior to initiation of construction.	Richvale Irrigation District			
	<p>Biological Resources MM-4 Swainson's Hawk Avoidance and Minimization Measures</p> <p>Suitable nesting habitat is present within the BSA. Additionally, the species has been previously observed nesting in the BSA by representatives from CDFW. Project activities at individual locations will be minimal and generally restricted to the edges of the canals and the dirt roadway directly adjacent. These small areas in the context of the greater area do not provide the species with suitable foraging habitat as they will forage more readily in grassland, pasture, or fallowed agricultural fields before disturbed dirt roadway or canal banks.</p>	Prior to initiation of construction	Richvale Irrigation District			

MM No.	Mitigation Measure	Timeframe for Implementation	Responsible Monitoring Agency	Verification of Compliance		
				Agency & Initials	Date	Notes
	<p>If feasible, construction activities should be conducted outside of the bird breeding season. (March 1-August 31). If work must occur during bird breeding season, to ensure that no indirect impacts to active nest occur due to any future construction activities, a qualified biologist will conduct a pre-construction survey for Swainson's hawk and raptor nests. The area to be surveyed will include a 0.5-mile radius including and surrounding the BSA. If active nests are discovered, the District will be notified. No construction will occur until appropriate buffers are established, based upon recommendations by the qualified biologist. The pre-construction survey will be conducted no less than 14-days and no more than 30-days prior to commencement of construction. Should an active nest(s) be discovered, it will be monitored at reasonable intervals, as determined by a qualified biologist. The status of nesting activities shall be included in monthly reports to the District and/or regulatory agencies, as appropriate. Additionally, standard construction BMPs will be implemented which include returning disturbed areas to pre-construction condition which would include reseeded with an appropriate, approved seed mix.</p>					
CULTURAL RESOURCES						
	<p>Cultural Resources MM-1</p> <p>Although no prehistoric sites have been formally recorded or otherwise identified within the project site, the presence of buried cultural resources is always a possibility. Therefore, although unlikely, if unknown resources are discovered during construction and excavation activities, the following Cultural Resources Minimization Measures will be included in all contract documents and construction plans.</p> <ul style="list-style-type: none"> Should archaeological resources be encountered at any point during project excavation and construction activities, all activity around the discovery will cease. The District will retain the services of a qualified archaeologist to examine the findings, assess their significance, and offer proposals for any exploratory procedures deemed appropriate to further investigate and/or mitigate any adverse impacts. Should human remains be encountered during excavation activities in the project area, the following procedures shall 	<p>During construction, if resources are discovered.</p>	<p>Richvale Irrigation District</p>			

MM No.	Mitigation Measure	Timeframe for Implementation	Responsible Monitoring Agency	Verification of Compliance		
				Agency & Initials	Date	Notes
	<p>be followed:</p> <ul style="list-style-type: none"> ○ Per Health and Safety Code §7050.5(b), the Butte County Coroner's Office will be contacted immediately; all work must cease, no further disturbances may occur until the Coroner has made findings as to the origins and disposition per Public Resources Code §5097.98. ○ If the Coroner determines the remains are Native American, the Office will notify the Native American Heritage Commission (NAHC) within 24 hours. ○ Following receipt of the Coroners notice, the NAHC will contact a Most Likely Descendent (MLD). The MLD will then have 48 hours in which to make recommendations to the District and the consulting archaeologist regarding the treatment and/or re-interment of the human remains and any associated grave items. 					

Appendix A
Biological Resources Assessment

Biological Resources Assessment

Richvale Irrigation District Infrastructure Modernization and Canal Operations Decision Support Project Butte County, California

June 2019



Prepared for:

Richvale Irrigation District
1193 Richvale Highway
Richvale, CA 95974

Prepared by:



111 Mission Ranch Blvd., Suite 100, Chico, CA 95926, Phone: 530.893.1600, Fax: 530.893.2113
info@NorthStarEng.com | www.NorthStarEng.com

Biological Resources Assessment

**Richvale Irrigation District Infrastructure Modernization and Canal Operations Decision
Support Project
Butte County, CA**

June 2019

Prepared for:

Sean Earley – General Manager
Richvale Irrigation District
1193 Richvale Highway
Richvale, CA 95974

Prepared by:



111 Mission Ranch Blvd., Suite 100, Chico, CA 95926, Phone: 530.893.1600, Fax: 530.893.2113
info@NorthStarEng.com | www.NorthStarEng.com

Table of Contents

1.	EXECUTIVE SUMMARY	1
2.	INTRODUCTION.....	2
2.1	Background	2
2.2	Project Area.....	2
3.	METHODS.....	6
3.1	Giant Garter Snake Habitat Assessment Methods	6
3.2	Biological Resources	7
3.2.1	Sensitive Natural Communities.....	7
3.2.2	Critical Habitat.....	8
3.2.3	Special-Status Species.....	8
3.3	Waters of the United States.....	8
3.4	Previous Surveys.....	9
4.	RESULTS	9
4.1	Existing Conditions.....	9
4.2	Habitat Types	9
4.2.1	Barren.....	10
4.2.2	Urban.....	10
4.2.3	Rice	10
4.2.4	Riverine.....	10
4.2.5	Pasture.....	11
4.2.6	Annual grassland.....	11
4.2.7	Fresh Emergent Wetland.....	11
4.2.8	Valley Foothill Riparian.....	11
4.3	Sensitive Natural Communities	12
4.4	Critical Habitat	12
4.5	Special-Status Species.....	12
4.5.1	Plants.....	20
4.5.2	Reptiles and Amphibians	20
4.5.3	Fish.....	25
4.5.4	Birds.....	25
4.5.5	Mammals.....	28
4.6	Waters of the United States.....	28
5.	REGULATORY FRAMEWORK	29
5.1	Federal Regulations	29
5.1.1	Federal Endangered Species Act.....	29
5.1.2	Migratory Bird Treaty Act Title 16 USC Section 703.....	30
5.1.3	Clean Water Rule: Definition of “Waters of the United States”; Final Rule (33 CFR Part 328).....	30
5.1.4	Clean Water Act (Title 33 U.S.C. §1251).....	31
5.2	State Regulations.....	33
5.2.1	California Endangered Species Act	33
5.2.2	California Fish and Game Code.....	33
5.2.3	Public Resources Code.....	34
6.	CONCLUSIONS AND RECOMMENDATIONS.....	34
6.1	Giant Garter Snake.....	34

6.2	Northwestern Pond Turtle	38
6.3	Swainson’s Hawk	39
6.4	Migratory Birds, and Nesting Raptors including Greater Sandhill Crane, Loggerhead Shrike, Merlin, Northern Harrier, Osprey, Song Sparrow and Tri- colored Blackbird	39
REFERENCES		40

List of Tables and Figures

Tables

Table 1. Types of Improvements that will be Implemented as part of the Project.	4
Table 2: Impact Area for Proposed Improvements.....	5
Table 3. Special-status Species and Sensitive Natural Communities Identified by USFWS, CNDDDB, and CNPS as Potentially Occurring in the Biological Survey Area.	14
Table 4. Estimated total area of temporary and permanent impacts to suitable GGS habitat.	24

Figures

Figure 1. Project location map.....	3
Figure 2. CNDDDB occurrences in the vicinity of the Biological Survey Area.....	13

Appendices

Appendix A. APE Maps
Appendix B. USFWS Species List
Appendix C. CNDDDB Species List
Appendix D. CNPS Species List
Appendix E. Species Observed

List of Abbreviated Terms

BOR	Bureau of Reclamation
BSA	Biological Survey Area
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFGF	California Fish and Game Code
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationships
EPA	U.S. Environmental Protection Agency
ESA	Federal Endangered Species Act
GGG	Giant Garter Snake
IPAC	Information for Planning and Consultation
MBTA	Migratory Bird Treaty Act
msl	Mean Sea Level
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRPW	Non-Relatively Permanent Waters
OWOUS	Other Waters of the United States
RID	Richvale Irrigation District
ROW	Right-of-way
RPW	Relatively Permanent Waters
RWQCB	Regional Water Quality Control Board
SNC	Sensitive Natural Community
SWRCB	State Water Resources Control Board

TNW	Traditional Navigable Waters
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WOUS	Waters of the United States

1. EXECUTIVE SUMMARY

NorthStar biologists and environmental scientists and Swaim Biological, Inc. biologists conducted biological surveys on the approximately 3,500-acre Biological Survey Area (BSA) for the proposed Richvale Irrigation District (RID, District) Infrastructure Modernization and Canal Operations Decision Support Project (Project). The Project is located in Butte County, within Township 19N, Range 02E of the Shippee, Biggs, West of Biggs, and Nelson U.S. Geological Survey (USGS) 7.5-minute quadrangles. More generally, RID is located in the northern Sacramento Valley, east of the Butte Creek and west of the Thermalito Afterbay within and surrounding the community of Richvale. The District's service area encompasses approximately 30,000 acres providing water primarily to agricultural customers. The District is bound on the north by the southern boundary of the Western Canal Water District, and on the south by the Cherokee Canal and the Biggs Extension Canal while the California Department of Fish and Wildlife's Upper Butte Basin Wildlife Area lies to the west. Adjoining water districts include Western Canal Water District to the north, Butte Water District to the east, and Biggs-West Gridley Water District to the south. The District is located in CALFED Subregion 5 and relies exclusively on surface water from the Bay-Delta watershed for its water supply. The BSA is composed of a variety of habitat types including barren, urban, riparian, annual grassland, riverine, freshwater wetland, pasture, and rice. A large portion of the land within the District has been in rice production due to the dominance of heavy clay soils, favorable climate conditions, and the availability of reliable water.

The proposed project is part of the District's comprehensive plan for customer delivery measurement, system modernization, and boundary flow monitoring developed as part of the 2014 Feather River Regional Agricultural Water Management Plan (FRRAWMP). The project will implement modernization improvements at 12 locations that include several improvement types to provide accurate delivery and flow measurements and monitoring.

Due to the generally disturbed nature of the BSA, suitable habitat for special-status plant species is minimal to non-existent. No special-status plant species were determined to have potential to occur within the BSA due to the disturbed nature of the BSA, continued agricultural activities in the vicinity, and continued canal maintenance. Additionally, species such as Sanford's arrowhead and woolly rose mallow that can be found in freshwater environments in the northern Central Valley were not observed during biological surveys.

The BSA potentially provides suitable habitat for two special-status reptile species including giant garter snake (GGS) (*Thamnophis gigas*), and northwestern pond turtle (*Actinemys marmorata*). Several giant garter snakes were observed within the District's canals during biological surveys of the BSA in June 2018.

There is no potential for any special-status fish species to occur within the BSA due to a lack of suitable riverine habitat for listed salmonids. Additionally, water diversions are required to be screened to prevent passage of adult anadromous fish from natural water bodies with connectivity to the ocean into the canals.

The BSA provides potentially suitable nesting habitat for a variety of birds including bald eagle (*Haliaeetus leucocephalus*), tricolored blackbird (*Agelaius tricolor*), greater sandhill crane (*Grus canadensis tabida*), loggerhead shrike (*Lanius ludovicianus*), merlin (*Falco columbarius*), northern harrier (*Circus hudsonius*), Osprey (*Pandion haliaetus*), Swainson's hawk (*Buteo swainsoni*). Additionally, the BSA provides suitable foraging and nesting habitat for variety of migratory birds protected by the Migratory Bird Treaty Act (MBTA) within the project boundaries.

2. INTRODUCTION

2.1 Background

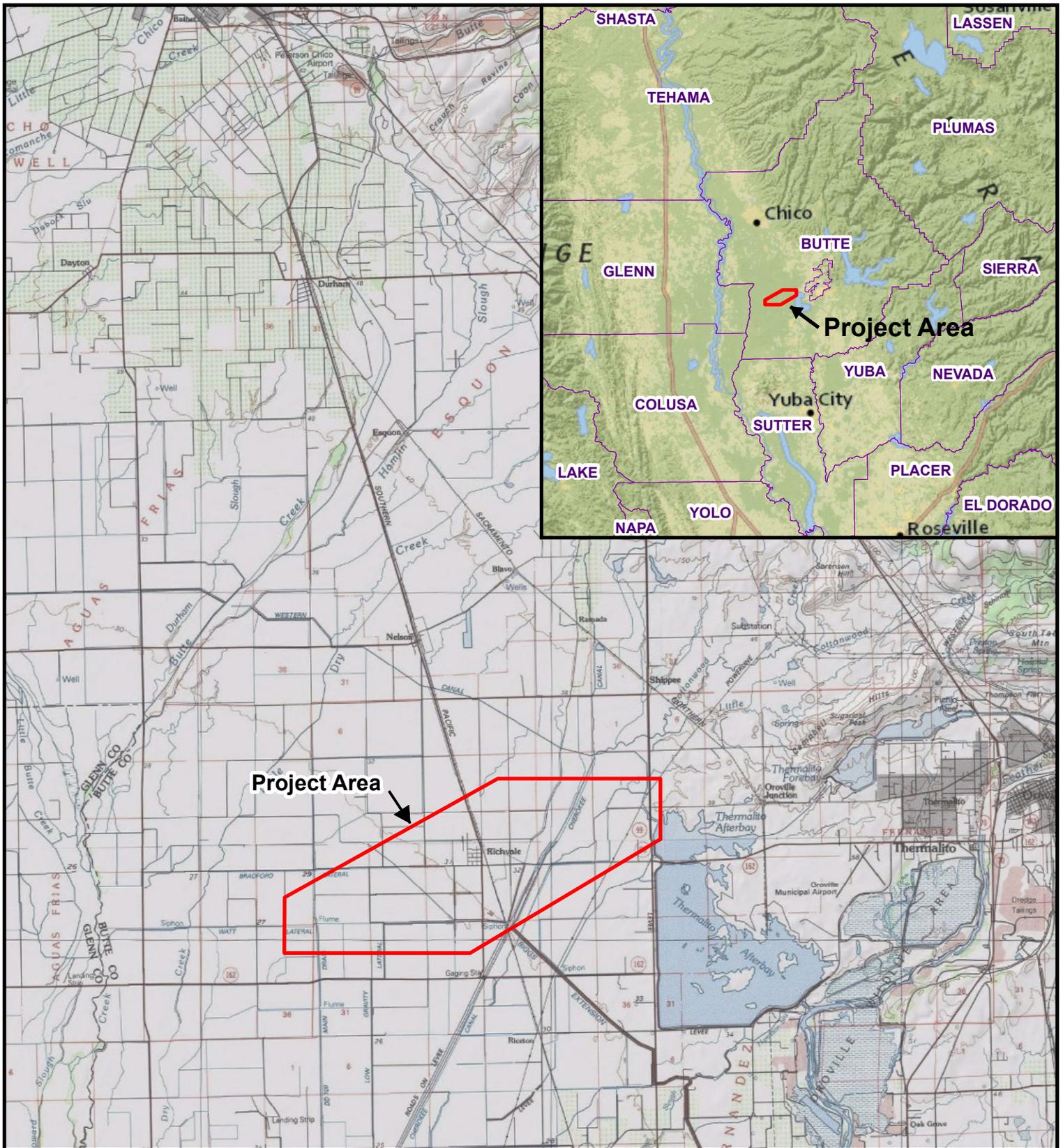
The proposed project is part of the District's comprehensive plan for customer delivery measurement, system modernization, and boundary flow monitoring developed as part of the 2014 Feather River Regional Agricultural Water Management Plan (FRRAWMP). The project will implement modernization improvements at 12 locations that include several improvement types to provide accurate delivery and flow measurements and monitoring.

NorthStar conducted biological surveys within a portion of the District's boundaries near the community of Richvale. Surveys were conducted on June 25 and 26, 2018 by NorthStar Environmental Scientists, Jake Sivertson, and Bryn Copson, as well as Swaim biologists, Eric Britt (PhD) and Cole Paris and on January 23, 2019 by NorthStar Biologist Matt Rogers and Environmental Scientist Jake Sivertson to determine the presence of sensitive natural resources and to determine if these resources would be impacted by the proposed projects. Mr. Sivertson and NorthStar biologist Matt Rogers returned to the BSA on January 23, 2019 to examine the lined sections for sensitive natural and aquatic resources.

2.2 Project Area

The Richvale Irrigation District Infrastructure Modernization and Canal Operations Decision Support Project is located in Butte County, within Township 19N, Range 02E of the Shippee, Biggs, West of Biggs, and Nelson U.S. Geological Survey (USGS) 7.5-minute quadrangles. More generally, RID is located in the northern Sacramento Valley, east of the Butte Creek and west of the Thermalito Afterbay within and surrounding the community of Richvale. The District's service area encompasses approximately 30,000 acres providing water primarily to agricultural customers. The District is bound on the north by the southern boundary of the Western Canal Water District, and on the south by the Cherokee Canal and the Biggs Extension Canal while the California Department of Fish and Wildlife's Upper Butte Basin Wildlife Area lies to the west. Adjoining water districts include Western Canal Water District to the north, Butte Water District to the east, and Biggs-West Gridley Water District to the south. The District is located in CALFED Subregion 5 and relies exclusively on surface water from the Bay-Delta watershed for its water supply. Landowners within the District also rely on groundwater to a limited extent, with increased reliance in years of severe drought and curtailment of surface water supplies from Lake Oroville.

The project includes the modification of facilities at 12 sites located throughout the District's water conveyance system in Butte County, California. Refer to **Attachment A** for Area of Potential Effect which depicts the location of all proposed improvement locations. The improvement program involves mostly minor construction activities, including upgrades to radial and actuated slide gates and weir boxes although the project does involve the lining of four canal sections as well, where construction work will be more involved. The District has received implementation funding through the California Department of Water Resources (DWR) and the U.S. Bureau of Reclamation (BOR), and the proposed actions are expected to be completed in 2021.



Project Area

Project Area

Legend

 Project Location

0 6,250 12,500 25,000
 Feet

1 inch = 12,500 ft (printed at 8.5 x 11)

Imagery Source:
 USGS Topo
 Inset Imagery:
 National Geographic



Within Township 19N
 Range 02E,
 Butte County, CA
 Biggs, West of Biggs,
 Shippee, & Nelson
 USGS 7.5' Quads

Map Date:
 February 1, 2019

Drawn By:
 TDA

NSE Project #
 18-031

Figure 1: Location Map

Richvale Irrigation District
 Irrigation Improvements - Butte County, CA



NORTHSTAR

... Designing Solutions

111 MISSION RANCH BLVD., SUITE 100 CHICO, CA 95926
 PHONE: (530) 893-1600 - www.NorthStarEng.com - © NorthStar

Description of Construction Activities

Project activities will vary according to the needs of each specific location. These activities will include structural improvements at lateral canal headings along the Main Canal and Main West Canal to provide control of water level, flow, measurement and automation. Improvements will mostly consist of retrofitting of existing structures with new automated gates or the installation of weir boxes and Remote Tracker (RT) brackets. In addition, at some locations, improvements will include the construction of a concrete-lined section of the water canal which will include buried conduit. Ground disturbance resulting in temporary and permanent impacts during the removal and replacement of irrigation pipes, headwalls, and other water conveyance structures is expected to occur. Therefore, construction activities will vary according to the needs of each specific improvement location.

For purposes of this assessment, project activities were divided into eight separate improvement types, four of which would result in ground disturbing activities ranging in size from 2,020 square feet (sf) to 18,915 sq. A list of improvement types and if ground disturbance is required can be seen in **Table 1**.

Table 1. Types of Improvements that will be Implemented as part of the Project.

Site Name	Construction Activity	Ground Disturbance Required
Ollies Weir/Humpy West/Humpy Weir	Line section, bury conduit (105 ft), replace board bays with metal slide gates. Humpy West to be abandoned, boards removed.	Yes
Humpy South	Line section, bury conduit (270 ft)	Yes
Mixing Box	Line sections, actuated slide gate retrofit, replace 4 bays with slide gates and High Pump heading, bury conduit (470 ft)	Yes
Bradford Lateral	Weir box and RT bracket	Yes
Peterson Lateral	Weir box and RT bracket	Yes
Jones Weir	Actuated slide gate – retrofit	No
Banyon Flume Resolution/Watts Heading	Replace board bays with metal slide gates and ITRC flap gate	No
9010 Weir	Replace board bays with metal slide gates	No
Rystrom Weir	Replace board bays with metal slide gates	No
Low Pump Heading and Drop Structure	New actuated radial gates	No
Floyd’s Weir	Actuated slide gate – retrofit	No
Tower Weir	Actuated slide gate – retrofit	No

Activities that require ground disturbance and structural modification will consist of excavation trenching, concrete lining, new structure placement, and backfilling. Depending on the project type, construction activities will be completed with an excavator, skid steer-loader, skid-steer trencher, dump truck, concrete mix truck, concrete pump truck, a flatbed truck with a crane, and pickup trucks.

Typical excavation activities associated with the lining of canals, will consist of removing, re-contouring, and re-compacting earthen material along the canal banks to create a landform that will facilitate the lining of the section with concrete. Rock slope protection would be placed along the side slopes of transition points to protect the concrete lined portions from scour. Earthen material from excavations of the lined portions of canal may be temporarily stockpiled adjacent to the canal along the access road within the staging area. All work will be performed adjacent to the structure from the point of access.

Work areas vary depending on the improvement type and will include the improvement project, construction staging, and stockpile areas, if applicable. Construction staging will take place on the canal access roads adjacent to the improvement area. If equipment and construction materials are stored outside

of the work area they will be located within the District’s maintenance yard and/or a construction easement would be obtained from adjacent land owners to utilize their existing agricultural operations yard. These yards are generally improved with gravel parking and outbuildings and are used for equipment storage, agricultural processing, vehicle maintenance, etc. All work areas will be clearly defined and marked to confine the areas of disturbance. In addition to the work areas, there are approximately 9.2 miles of access roads providing ingress and egress to the improvement sites. **Table 2** provides a summary of the impact area for the improvements.

Table 2: Impact Area for Proposed Improvements

Improvement Site	Impact Area Width, ft	Impact Area Length, ft	Permanent Impact Area, ft ²	Temporary Impact Area, ft ²	Max. Impact Depth (ft)
Tower Weir (Slide Gate Retrofit)	45	45	0	2,000	0
Mixing Box (Slide Gate Retrofit, 470 ft Buried Conduit)	70	70	1,175	4,850	3
Floyds’s Weir (Slide Gate Retrofit)	45	45	0	2,000	0
Drop Structure (New Radial Gate)	45	45	0	2,000	0
Peterson Lateral (Weir Box and RT Bracket)	45	45	20	2,000	6
Bradford Lateral (Two Weir Box and RT Brackets)	45	45	40	4,000	6
Jones Weir (New Slide Gate)	45	45	0	2,000	0
9010 Weir (New Slide Gate)	45	45	0	2,000	0
Humpy South (270 ft Buried Conduit, Surface Mount RTU)	43	43	675	1,850	3
Ollies Weir/Humpy West (New Slide Gate, 105 ft Buried Conduit)	50	50	263	2,525	3
Rystrom Weir (New Slide Gate)	45	45	0	2,000	0
Banyon Flume/Watts Heading (Three Manual Slide Gates, New ITRC Flap Gate)	45	45	0	4,000	0
Lined Sections					
Main South.	32	30	960	6,560	4
High Pump	17	30	510	5,360	4
Humpy South	28	30	840	6,240	4
Humpy West	31	30	930	6,480	4

Construction at each work location would be short in duration as the project mostly involves small replacements of water control structures such as weir boxes although lining canal sections may be longer in duration. Due to water delivery constraints during the irrigation season it is anticipated that some work may be necessary during the GGS inactive season, as this also coincides with a time when the District’s canals are typically dry. However, when feasible, project construction will be conducted during the snake’s active season (May-October). It is assumed that construction activities would likely occur concurrently at multiple locations. For activities involving retrofitting existing structures, the ease of construction and reduction in earthmoving activities has the potential to shorten the construction window for those types.

Construction is slated to begin in 2019. The schedule is influence by inclement weather, timing of the execution of access agreements and permits, work windows and constraints that may be imposed by

conditions defined in applicable permits. The project and construction activities are slated for completion in 2021. An extended timeframe may be required for construction completion dependent upon weather and permit requirements.

For construction activities anticipated to occur between October 1 through April 30 (GGS inactive season), any pre-construction activities that can occur, such as mechanical mowing, hand cutting, and site preparation, would be completed prior to September 15 of the year in which winter work is expected. Proposed avoidance and minimization measures that impact work scheduling are discussed in Avoidance and Minimization Measures.

3. METHODS

The biological survey area (BSA) is made up of adjacent canals and laterals, grouped into survey areas encompassing all the district's water conveyance facilities requiring upgrades through this project. Each survey area was examined for the potential habitat for giant garter snake (*Thamnophis gigas*) as well as other special-status species.

Swaim Biological, Inc. prepared a habitat assessment for the proposed project to address the suitability of habitats present within the BSA, the potential impacts to habitat present, and recommended avoidance and minimization to reduce potential impacts to habitat.

For this assessment, habitat evaluation criteria were identified based on recognized minimum ecological requirements for GGS (USFWS 2006). During the visual habitat assessment, the criteria at each site were assigned a numerical score and using the cumulative total, each site was classified as containing either unsuitable, marginal or suitable GGS habitat.

The area of habitat anticipated to be temporarily and permanently impacted for each improvement type is also reported in this assessment. Work area dimensions and area of temporary and permanent impacts for each improvement type were estimated using information provided by Davids Engineering.

3.1 Giant Garter Snake Habitat Assessment Methods

Between June 19, 2018 and January 23, 2019, biologists conducted field surveys at all work locations in order to characterize the habitat present and assess its potential to support the GGS. During the surveys, habitat was evaluated at each site, and characteristics were recorded on a worksheet using a list of 15 variables associated with GGS presence. The information was then entered in a database to calculate the cumulative habitat scores for each site. Scoring methodologies were adopted from the USFWS 1999 Draft Recovery Plan for the Giant Garter Snake (Appendix D: Page 157) and were based on recognized minimum ecological requirements for the species. The modified habitat assessment score sheet and instructions for completing the form are included as appendices in the GGS Habitat Assessment. Representative photographs of project features and GGS are provided in the assessment.

Assessed areas included aquatic and upland habitats, including interconnected ditches, drains, channels or swales, within 50 feet of identified features of the customer turnouts. Due to the large number of sites included in the assessment, aquatic sampling for amphibians and fish was not conducted. Instead, variables associated with the presence of prey or introduced fish were estimated by the relative size and hydrological connectivity of the aquatic habitat. Habitat classification break points were based upon recognized habitat characteristics of GGS and their life history, distribution, and habitat requirements. Habitat was assessed using the following guidelines:

Suitable Habitat

Work locations that scored between **20 – 28** on the habitat evaluation form were considered to contain suitable GGS habitat. Suitable habitat contains an abundance of the water needed for GGS foraging throughout the active season, the aquatic vegetation required for cover, and bankside refugia needed for foraging and terrestrial movement. During the active and dormant seasons, GGS prefer sunny banks with vegetation refugia or riprap that is used for basking and underground seasonal aestivation. Large, slow moving, and shallow aquatic habitats with gradually inclining banks are often preferable to deep, fast current channels that lack the herbaceous emergent vegetation typically found in GGS foraging habitat. In the Sacramento Valley, suitable GGS habitat requirements can be summarized as follows (USFWS 2006):

- 1) Adequate water during the snake's active season (early-spring through mid-fall) to provide food and cover;
- 2) Emergent herbaceous wetland vegetation for escape cover and foraging habitat during the active season;
- 3) Basking habitat of grassy banks and openings in waterside vegetation; and
- 4) Higher elevation uplands for cover and refuge from flood waters during the snake's dormant season in the winter.

Marginal Habitat

Work locations that received a habitat score of **17 – 19** were considered to be marginal GGS habitat. Marginal habitat contained only a minimal amount of the water, vegetation and refugia that is required for the snake. In portions of the project area containing marginal habitat, permanent water courses may have been present nearby but the surrounding area typically contained orchards or other land uses not suitable to sustain GGS populations. Water channels in riparian areas with high canopies or concrete-lined canals, bankside woody and densely vegetated banks that did provide sunny basking sites could be a deterrent to the GGS and were considered marginal habitat. Canal sections with steep banks with few or no shallow water areas that sustained herbaceous emergent vegetation typically found in GGS foraging habitat were considered marginal habitat. On its own, marginal habitat is considered incapable of supporting permanent populations of giant garter snakes and is typically ephemeral, providing no permanent source of prey. However, giant garter snakes may use areas of marginal habitat as connective corridors between areas of more suitable habitat.

Unsuitable Habitat

Work locations that scored between **0 – 16** were considered to be unsuitable habitat for GGS. Unsuitable habitat lacked summer aquatic and bankside basking areas with emergent vegetation for cover and thermal regulation. Uplands were usually absent, degraded, (e.g., row crop, orchard, overgrazed pasture, residential/developed, etc.), or lacked the refugia needed for extended periods of inactivity. Large rivers or fast-flowing canals with gravel or rock substrate composed of tall riparian, shaded banks would also be considered unsuitable habitat. Large rivers and flood plains that lacked higher elevation upland habitat with limited opportunities for cover and refuge from flood waters during the snake's inactive season also would be considered unsuitable.

3.2 Biological Resources

3.2.1 Sensitive Natural Communities

Utilizing Rarefind 5, NorthStar accessed the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDDB) to identify Sensitive Natural Communities (SNCs) occurring on the Biggs and eight surrounding USGS 7.5-minute quadrangles. These SNCs were then surveyed for within the BSA during the field visit.

3.2.2 Critical Habitat

NorthStar determined if United States Fish and Wildlife Service (USFWS)-designated critical habitat for special-status species occurs in the BSA by reviewing the USFWS Information for Planning and Consultation (IPAC) database for the project site.

3.2.3 Special-Status Species

NorthStar obtained lists of special-status species that potentially occur in the vicinity of the BSA from the USFWS IPAC (USFWS, **Appendix B**), the CDFW's CNDDDB, (**Appendix C**), and the California Native Plant Society's (CNPS) Online Rare and Endangered Plant Inventory v8-02 (**Appendix D**).

Biological surveys were conducted within the BSA on June 25-27 2018, and January 23-24 of 2019 by NorthStar biologists, environmental scientists and technicians, Matt Rogers, Jake Sivertson, and Bryn Copson, as well as Swaim Biological, Inc. biologists, Eric Britt, and Cole Paris. General biological resource surveys and habitat assessments were conducted to determine the presence of special-status species and habitats in the BSA and to determine if these resources would be impacted by the proposed grading project. The survey included conducting meandering transects throughout the BSA, with special focus on habitat types frequently associated with special-status species. Species observed during biological surveys can be found in **Appendix E**.

Following the field survey, the "potential for occurrence" was determined based on the quality and types of habitats observed on the site. For plants, the potential for occurrence on site is considered during the appropriate survey/flowering period. For birds and bats, the potential for occurrence is considered during the appropriate timeframes when these species breed, forage, roost, over-winter, or stop-over in the BSA during migration. Any bird or bat species could fly over the BSA, but this is not considered a potential for occurrence. The categories for the potential for occurrence include:

- **None:** The species or natural community is known not to occur, and has no potential to occur in the BSA based on sufficient surveys, the lack of suitable habitat (including soil, vegetation, connectivity, etc.), and/or the BSA is well outside of the known distribution of the species.
- **Low:** Potential habitat in the BSA is sub-marginal and the species is not known to occur in the vicinity of the BSA. Protocol-level surveys are not recommended.
- **Moderate:** Suitable habitat is present in the BSA and the species is known to occur in the vicinity of the BSA.
- **High:** Habitat in the BSA is highly suitable for the species and there are reliable records close to the BSA, but the species was not observed.
- **Known:** The species or natural community was detected in the BSA or a recent reliable record exists for the BSA.

3.3 Waters of the United States

NorthStar biologist, Matt Rogers and NorthStar environmental scientists Jake Sivertson, and Bryn Copson, as well as Swaim biologists, Eric Britt and Cole Paris, conducted a delineation of aquatic resources on June 25 and 26, 2018 and January 23, 2019. The delineation involved an examination of botanical, hydrological features, and determination of wetland characteristics based on the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008), and the *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook* (USACE 2007).

3.4 Previous Surveys

There are no known previous surveys conducted within the District's boundaries.

4. RESULTS

4.1 Existing Conditions

The BSA is composed primarily of irrigation canals and rice fields, small areas of riparian habitat are found along the canals in the southern portion of the BSA. More urban and residential habitats are found within the central portion of the BSA within and surrounding Richvale. Vegetation observed within the District included species typical of urban and rural areas, pastures, rice, disturbed grasslands, riparian areas, and freshwater wetland habitats throughout the valley. The vegetation along the District's canals is dominated by non-native grasses and forbs along the top and upper portion of the canal banks and hydrophytic species along the lower portions near the water line and within the canal.

Non-native grass and forb species observed along the upper portions of the canal banks include johnsongrass (*Sorghum halepense*), crab grass (*Digitaria sanguinalis*), slender wild oat (*Avena barbata*), seashore vervain (*Verbena litoralis*), yellow star thistle (*Centaurea solstitialis*), field mustard (*Brassica rapa*), curly dock (*Rumex crispus*), horseweed (*Erigeron canadensis*), prickly lettuce (*Lactuca serriola*) and field bindweed (*Convolvulus arvensis*). The composition of species is heavily affected by mowing and herbicide applications conducted during routine canal maintenance of the access roads. Hydrophytic species encountered along the lower portions of the canal banks and within the canals include cattail (*Typha latifolia*), hardstem bulrush (*Schoenoplectus acutus*), water primrose (*Ludwigia hexapetala*), marsh purslane (*L. peploides*), mosquito fern (*Azolla filiculoides*), duckweed (*Lemna* sp.), and watergrass (*Echinochola crus-galli*).

The vegetation in the more urban portions of the district consists of ornamental tree species typical of residential landscaping including fruitless mulberry (*Morus alba*), Chinese pistache (*Pistacia chinensis*), palm (*Washingtonia* sp.), eucalyptus (*Eucalyptus* sp.), silver maple (*Acer saccharinum*), camphor (*Cinnamomum camphora*), cypress, and birch (*Betula* sp.). Ground cover consists of manicured landscaping including a variety of shrubs and herbaceous species and lawn.

Soils within the District generally consist of clay alluvium over loamy alluvium. A majority of the District is covered by four soil map units defined by the Natural Resources Conservation Service (NRCS), including Lofgren-Blavo Complex 0 to 1 percent slope, Esquon-Neerdobe Complex, 0 to 1 percent slopes, Duric Xerarents-East Biggs Complex 0 to 1 percent slope, and Esquon Silt Loam 0 to 1 percent slope. Topography is generally flat sloping to the southwest with elevations ranging from approximately 110 feet above mean sea level (msl) to approximately 60 feet above msl near the southwestern portion of the District. Weather within the District is typical of Mediterranean climates with hot, dry summers and mild winters with low to moderate rainfall amounts. Average rainfall is approximately 27 inches with a majority falling between November and March.

4.2 Habitat Types

California habitat types are described in the California Wildlife Habitat Relationships (CWHR) system based on classifications created by Mayer and Laudenslayer (1988). The CWHR system was designed to aid in the mapping of habitats utilized by California's commonly-occurring birds, mammals, reptiles, and amphibians.

The BSA is composed primarily of irrigation canals and rice fields, small areas of riparian habitat are found along the Cherokee Canal. More urban and residential habitats are found within the central portion of the BSA within and surrounding Richvale.

4.2.1 *Barren*

Barren habitat is defined by a lack of vegetation. Structure and composition of the substrate is often determined by the region of the state, the surrounding environment, and geologic conditions. Barren areas represent extreme environments for vegetation (i.e. impermeable substrate, vertical slope). Barren habitats are found in juxtaposition with a wide variety of habitat types throughout California. Where vegetation is absent the structure of the substrate becomes the primary component of the habitat.

Barren habitat is sporadically found throughout the District boundaries. It primarily occurs on pathways and access roads adjacent to the canals.

4.2.2 *Urban*

Urban habitat occurs throughout California from small villages to the largest metropolitan areas. The vegetative structure within urban habitats can be quite variable, but is often maintained. Species composition can be dominated by exotic species but many times natives can be found as they can be better suited to the physical conditions of the region. Lawns are the typical groundcover found in urban habitats, they are comprised of a variety of grass species and are almost always irrigated. Urban habitat is present in the form of single-family residences throughout the BSA. The homes within the BSA are maintained and includes ornamental trees and shrubs plus a lawn. Species observed in urban habitat included European starling (*Sturnus vulgaris*) and house sparrow (*Passer domesticus*).

Urban habitat is primarily found within and surrounding Richvale as well as residential land uses located adjacent to agricultural land uses within the District.

4.2.3 *Rice*

Rice is found growing throughout the northern Central Valley typically on level terrain with heavy clay soils that hold water well. Rice is a flood irrigated annual crop grow in laser leveled fields that are flooded and then dried down to let the seed mature and to facilitate harvesting of the fields. Rice crops are typically planted in the spring and harvested in the fall months. Wildlife observed in this habitat included Brewer's blackbird (*Euphagus cyanocephalus*), red-winged blackbird (*Agelaius phoeniceus*), killdeer (*Charadrius vociferus*), and great blue heron (*Ardea herodias*).

This habitat type is found covering large areas of the BSA, surrounding the community of Richvale.

4.2.4 *Riverine*

Riverine habitats consist of intermittent or perennial water. Higher elevation rivers and streams tend to be smaller and higher velocity. At lower elevations, rivers and streams become slow and enlarged. The transition from higher elevation to lower will cause temperature and turbidity to increase, dissolved oxygen will decrease and the bottom will transition from rocky towards muddy or silty. Riverine habitats are found in close association with terrestrial habitats and in many cases, are contiguous with lake and emergent wetland habitats.

Riverine habitat is present along Cherokee Canal at the southern border of the District, additionally, many of the canals throughout the District function similarly to riverine habitat.

4.2.5 Pasture

Pasture habitats are planted on flat and gently rolling terrain on soils not suitable for other crops and where an ample water supply is available (Mayer and Laudenslayer, 1988). Vegetation composition within pastures are a mix of perennial grasses and legumes that typically provide 100 percent canopy cover. The plant species seeded in pastures varies depending on management practices used and geographic area. Some typical plant species occurring in pastures includes Bermuda grass (*Cynodon dactylon*), dallisgrass (*Paspalum dilatatum*), rye grass (*Lolium* spp.), a variety of clovers (*Trifolium* sp.), and pacific rush (*Juncus effusus*). The height and density of the vegetation is dependent on cultural and management practices including the type of livestock and the duration of the grazing. Pastures can be utilized by a variety of wildlife including ground nesting birds such as waterfowl, pheasant, cranes, egrets, and killdeer. Pastures also provide foraging habitat for raptor species including northern harriers and white-tailed kites and mammal species including deer.

Pasture habitat is found sporadically to the west of Richvale as well in small portions at the periphery of the town at rural residences.

4.2.6 Annual grassland

Annual grasslands are described as open grasslands composed primarily of annual plant species. Species commonly found within annual grasslands include wild oats (*Avena fatua*), ripgut brome (*Bromus diandrus*), red brome (*Bromus madritensis*), soft chess (*Bromus hordeaceus*), wild barely (*Hordeum spontaneum*), foxtail fescue (*Vulpia myuros*), filaree (*Erodium* spp.), and various clovers (*Castilleja*) among others. Wildlife species that use annual grasslands include the western fence lizard (*Sceloporus occidentalis*), garter snake (*Thamnophis*), western rattlesnake (*Crotalus oreganus*), black-tailed jackrabbit (*Lepus californicus*), California ground squirrel (*Otospermophilus beecheyi*), burrowing owl (*Athene cunicularia*), horned lark (*Eremophila alpestris*), western meadowlark (*Sturnella neglecta*), northern harrier (*Circus hudsonius*), and American kestrel (*Falco sparverius*).

Annual grassland habitats are found on the upper portions of most of the canals within the District. They tend to occur in narrow strips rather than large portions of contiguous land.

4.2.7 Fresh Emergent Wetland

Fresh emergent wetlands are found throughout California and typically occur in level to gently rolling terrain. Fresh emergent wetlands are flooded enough that plants present are able to prosper in anaerobic conditions. This habitat is dominated by emergent hydrophytes such hardstem bulrush (*Schoenoplectus acutus*) and cattail (*Typha latifolia*). Typical wildlife observed in this habitat include great egret (*Ardea alba*), great blue heron, killdeer, red-winged blackbird, Brewer's blackbird, wood duck (*Aix sponsa*), mallard (*Anas platyrhynchos*), Sierran tree frog (*Pseudacris sierra*) and red swamp crayfish (*Procambarus clarkia*).

Fresh emergent wetland habitat is found within many of the canals within the District's boundaries.

4.2.8 Valley Foothill Riparian

Valley foothill riparian habitat generally is found in association with riverine systems in California. Structurally, valley foothill riparian habitats are quite diverse, containing distinct vegetation layers. Fremont cottonwood (*Populus fremontii*) and Goodding's black willow (*Salix gooddingii*) dominated the canopy of the valley foothill riparian habitats on the site. The understory was quite sparse while the herbaceous layer consisted mostly of non-native grasses.

The diversity of vegetative structure within valley foothill riparian habitats provides food, water, nesting, dispersal habitat, and shelter for a number of species. On the site Bullock's oriole (*Icterus bullockii*), western kingbird (*Tyrannus verticalis*), lesser goldfinch (*Spinus psaltria*), house finch (*Haemorhous mexicanus*), Bewick's wren (*Thryomanes bewickii*), tree swallow (*Tachycineta bicolor*), northern mockingbird (*Mimus polyglottus*), and western fence lizard (*Sceloporus occidentalis*) were all encountered in the valley foothill riparian habitat within the BSA.

Valley foothill riparian habitat is found in very small portions primarily along the Cherokee canal east and south of Richvale.

4.3 Sensitive Natural Communities

Sensitive natural communities (SNCs) are important ecologically as their elimination or degradation could threaten populations of dependent plant and wildlife species and significantly reduce the regional distribution and viability of the community. The loss of SNCs may eliminate or reduce important ecosystem functions including water filtration by wetlands or bank stabilization by riparian woodlands.

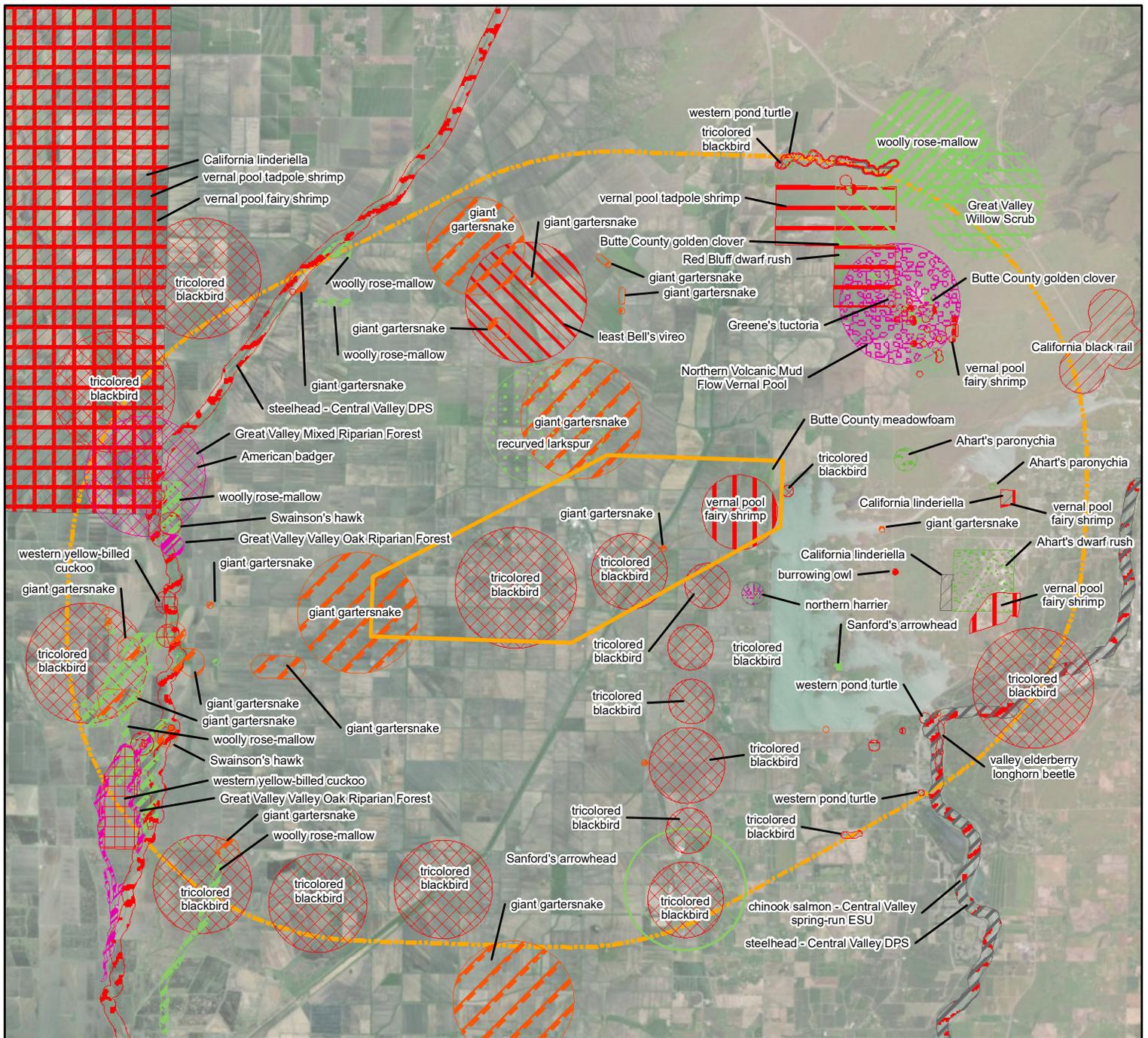
No SNCs are present within the BSA.

4.4 Critical Habitat

No designated critical habitat is found within the project areas.

4.5 Special-Status Species

All of the special-status species listed by the USFWS, CDFW, and CNPS as occurring within the BSA and/or eight surrounding USGS quadrangles are presented in **Table 3** along with their assessed potential to occur within the BSA. A map of all CNDDDB special-status species occurrences within five miles of the BSA is provided in **Figure 2**. The special-status species with the potential to occur within the BSA are giant garter snake (*Thamnophis gigas*), northwestern pond turtle (*Actinemys marmorata*), bald eagle (*Haliaeetus leucocephalus*), greater sandhill crane (*Antigone canadensis*), loggerhead shrike (*Lanius ludovicianus*), merlin (*Falco columbarius*), northern harrier (*Circus hudsonius*), Swainson's hawk (*Buteo swainsoni*), osprey (*Pandion haliaetus*), song sparrow "Modesto population" (*Melospiza melodia*) and tricolored blackbird (*Agelaius tricolor*). Additionally, suitable habitat for a variety of migratory birds and raptors occurs within the BSA.



Project Location	Ferris' milk-vetch	bald eagle	northern harrier	water star-grass
Ahart's dwarf rush	Great Valley Cottonwood Riparian Forest	bank swallow	pappose tarplant	watershed
Ahart's paronychia	Great Valley Mixed Riparian Forest	bent-flowered fiddleneck	pink creamsacs	western pond turtle
American badger	Great Valley Valley Oak Riparian Forest	burrowing owl	recurved larkspur	western yellow-billed cuckoo
Baker's navarretia	Great Valley Willow Scrub	chinook salmon - Central Valley spring-run ESU	silver-haired bat	woolly rose-mallow
Brazilian watermeal	Greene's tuctoria	giant gartersnake	slender Orcutt grass	yellow warbler
Butte County golden clover	North American porcupine	great blue heron	song sparrow ("Modesto" population)	5 Mile Buffer
Butte County meadowfoam	Northern Hardpan Vernal Pool	greater sandhill crane	steelhead - Central Valley DPS	
California alkali grass	Northern Volcanic Mud Flow Vernal Pool	heartscale	subtle orache	
California black rail	Peruvian dodder	least Bell's vireo	tricolored blackbird	
California linderiella	Red Bluff dwarf rush	lesser saltscale	valley elderberry longhorn beetle	
California tiger salamander	Sanford's arrowhead	loggerhead shrike	vernal pool fairy shrimp	
Coastal and Valley Freshwater Marsh	Swainson's hawk	merlin	vernal pool tadpole shrimp	

Within Township 19N,
Range 02E, MDM
Butte County, CA
Shippe, Biggs, West of Biggs,
& Nelson USGS 7.5' Quad

Imagery Source:
ESRI, February 2019;
CNDBB Data Provided By:
CA Dept. of Fish and Wildlife

**CNDBB Occurences
within 5 miles**

0 0.75 1.5 3 Miles

1 inch = 2 miles (printed at 8.5 x 11)

Map Date: February 8, 2019	Drawn By: TDA	NSE Project # 18-031
-------------------------------	------------------	-------------------------

**Richvale Irrigation District Improvements
- Butte County, CA -**

NORTHSTAR
 ... Designing Solutions

111 MISSION RANCH BLVD., SUITE 100 CHICO, CA 95926
 PHONE: (530) 893-1600 - www.NorthStarEng.com - © NorthStar

Table 3. Special-status Species and Sensitive Natural Communities Identified by USFWS, CNDDDB, and CNPS as Potentially Occurring in the Biological Survey Area.

Common Name (Scientific Name)	Status Fed/State/ CNPS	Associated Habitats	Potential for Occurrence*
SENSITIVE NATURAL COMMUNITIES			
Coastal and Valley Freshwater Marsh	_/_SNC/_/_	Occurs near river mouths, oxbows, and other areas in the floodplain, and along margins of lakes and springs, where water is quiet and permanently flooded by freshwater. Dominated by perennial, emergent monocots 4-5 meters tall.	<u>None</u> : Does not occur within the BSA.
Great Valley Cottonwood Riparian Forest	_/_SNC/_/_	Perennial creeks and rivers in the Central Valley.	<u>None</u> : Does not occur within the BSA.
Great Valley Mixed Riparian Forest	_/_SNC/_/_	A tall, dense, winter-deciduous, broadleaved riparian forest. The tree canopy is usually fairly well closed and moderately to densely stocked with several species including <i>Acer negundo</i> , <i>Juglans hindsii</i> , <i>Platanus racemosa</i> , <i>Populus fremontii</i> , and <i>Salix</i> spp.	<u>None</u> : Does not occur within the BSA.
Great Valley Valley Oak Riparian Forest	_/_SNC/_/_	Occurs on the deep alluvial soils of higher floodplain terraces in association with river systems. Can also be found in other upland communities.	<u>None</u> : Does not occur within the BSA.
Great Valley Willow Scrub	_/_SNC/_/_	Pioneer riparian community found on depositional areas near the edge of intermittent and perennial creeks and rivers.	<u>None</u> : Does not occur within the BSA.
Northern Basalt Flow Vernal Pool	_/_SNC/_/_	Associated with low- to mid-elevation seasonally flooded depressions on impermeable soils.	<u>None</u> : Does not occur within the BSA.
Northern Hardpan Vernal Pool	_/_SNC/_/_	Seasonally flooded depressions on impermeable soils or rock.	<u>None</u> : Does not occur within the BSA.
Northern Volcanic Mud Flow Vernal Pool	_/_SNC/_/_	Seasonally flooded depressions on impermeable soils or rock.	<u>None</u> : Does not occur within the BSA.
PLANTS			
Adobe Lily (<i>Fritillaria pluriflora</i>)	_/_/__/1B.2	Chaparral, cismontane woodland, valley and foothill grassland. (Feb-Apr)	<u>Low</u> : Sub-marginal grassland habitat present in the BSA.
Adobe Navarretia (<i>Navarretia nigelliformis</i> ssp. <i>nigelliformis</i>)	_/_/__/4.2	Woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools. (Apr-Jul)	<u>None</u> : No suitable habitat within BSA.
Ahart's Dwarf Rush (<i>Juncus leiospermus</i> var. <i>ahartii</i>)	_/_/__/1B	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland, vernal pools / vernal mesic areas. (Mar-May)	<u>None</u> : No vernal pool habitat within BSA.
Ahart's Paronychia (<i>Paronychia ahartii</i>)	_/_/__/1B	Cismontane woodland, valley and foothill grassland, and vernal pools. (Mar-Jun)	<u>None</u> : No vernal pool habitat within BSA.
Baker's Navarretia (<i>Navarretia leucocephala</i> ssp. <i>bakeri</i>)	_/_/__/1B	Woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools. (Apr-Jul)	<u>None</u> : Not known to occur in Butte County. Nearest occurrence along

Common Name (Scientific Name)	Status Fed/State/ CNPS	Associated Habitats	Potential for Occurrence*
			Pennington Rd. in 1936.
Bent-flowered fiddleneck (<i>Amsinckia lunaris</i>)	___/___/1B	Cismontane woodland, valley and foothill grassland, and coastal bluff scrub.	<u>Low</u> : Sub-marginally suitable grassland found within the BSA.
Bidwell's knotweed (<i>Polygonum bidwelliae</i>)	___/___/4.3	Grows in chaparral, woodland, and grassland habitat on volcanic soils.	<u>None</u> : No suitable habitat within BSA.
Big-scale Balsam Root (<i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i>)	___/___/1B	Cismontane woodlands and chaparral. Valley and foothill grasslands. Sometimes serpentinite. (Mar-June)	<u>Low</u> : Sub-marginally suitable grassland habitat within BSA.
Brassy Bryum (<i>Bryum chryseum</i>)	___/___/4.3	Chaparral (openings), cismontane woodlands, valley and foothill grassland.	<u>Low</u> : Sub-marginally suitable grassland habitat found within the BSA.
Brazilian Watermeal (<i>Wolffia brasiliensis</i>)	___/___/2	Marshes and swamps (shallow freshwater). (Apr-Dec)	<u>Low</u> : Sub-marginal freshwater habitat present within the BSA.
Butte County Golden Clover (<i>Trifolium jokerstii</i>)	___/___/1B	Valley and foothill grassland, vernal pools. (Mar-May)	<u>None</u> : No vernal pool habitat within BSA.
Butte County Meadowfoam (<i>Limnanthes floccosa</i> ssp. <i>californica</i>)	FE/SE/1B	Valley and foothill grassland, vernal pools. (Mar-May)	<u>None</u> : No vernal pools habitat within BSA.
California Alkaligrass (<i>Puccinellia simplex</i>)	___/___/1B	Grows in mineral springs and other moist habitat with saline soils in the Central Valley, Mojave Desert, and other areas.	<u>None</u> : No suitable habitat within BSA.
Depauperate Milk-Vetch (<i>Astragalus pauperculus</i>)	___/___/4.3	Vernally mesic, volcanic, chaparral, cismontane woodland, valley and foothill grassland. (Mar-Jun)	<u>None</u> : No suitable vernal mesic habitat within BSA.
Ferris's Milk-vetch (<i>Astragalus tener</i> var. <i>ferrisiae</i>)	___/___/1B	Meadows and seeps, valley and foothill grassland. (Apr-May)	<u>None</u> : Known only from four extant records in Glenn and Butte Counties.
Greene's Tuctoria (<i>Tuctoria greenei</i>)	FE/___/1B	Vernal pools. (May-Jul/Sept)	<u>None</u> : No vernal pool habitat within BSA
Heartscale (<i>Atriplex cordulata</i>)	___/___/1B	Chenopod scrub, meadows and seeps, valley and foothill grassland (saline or alkaline). (Apr-Oct)	<u>Low</u> : Sub-marginal grassland habitat present in the BSA.
Hogwallow Starfish (<i>Hesperex caulescens</i>)	___/___/4.2	Sometimes alkaline. Valley and foothill grassland (mesic, clay), vernal pools (shallow). (Mar-Jun)	<u>None</u> : No vernal pool habitat within BSA
Lesser Saltscale (<i>Atriplex minuscule</i>)	___/___/1B	Chenopod scrub, playas, alkaline, sandy valley and foothill grassland (May-Oct).	<u>Low</u> : Sub-marginal grassland habitat present in the BSA.
Mexican mosquito fern (<i>Azolla microphylla</i>)	___/___/4.2	Marshes and swamps (ponds, slow water). (Aug)	<u>Low</u> : Sub-marginal swamp and ponding water present within the BSA.
Pappose Tarplant (<i>Centromadia parryi</i> ssp. <i>parryi</i>)	___/___/1B	Chaparral, coastal prairie, meadows and seeps, coastal salt marshes and swamps, and alkaline vernal mesic valley and foothill grasslands (May-Nov)	<u>None</u> : No vernal mesic habitat present in the BSA.
Parry's rough tarplant (<i>Centromadia parryi</i> ssp. <i>Rudis</i>)	___/___/4.2	Alkaline, vernal mesic, seeps, sometimes roadsides. Valley and foothill grassland. Vernal pools. (May-Oct)	<u>None</u> : No vernal pool habitat present in the BSA.

Common Name (Scientific Name)	Status Fed/State/ CNPS	Associated Habitats	Potential for Occurrence*
Peruvian Dodder (<i>Cuscuta obtusiflora</i> var. <i>glandulosa</i>)	___/___/2B	Freshwater marshes and swamps. (Jul-Oct)	<u>None</u> : Presumed extinct in California.
Pink Creamsacs (<i>Castilleja rubicundula</i> ssp. <i>rubicundula</i>)	___/___/1B.2	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland (serpentine). (Apr-Jun)	<u>Low</u> : Sub-marginal grassland habitat present within the BSA.
Recurved Larkspur (<i>Delphinium recurvatum</i>)	___/___/1B.2	Chenopod scrub, cismontane woodland, valley and foothill grassland (alkaline). (Mar-Jun)	<u>Low</u> : Sub-marginal grassland habitat present within the BSA.
Red Bluff Dwarf Rush (<i>Juncus leiospermus</i> var. <i>leiospermus</i>)	___/___/1B.1	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland and vernal pools/vernally mesic habitats. (Mar-May)	<u>Low</u> : Sub-marginal mesic habitat present within the BSA.
Sanford's Arrowhead (<i>Sagittaria sanfordii</i>)	___/___/1B	Marshes and swamps, assorted shallow freshwater. (May-Oct)	<u>Low</u> : Marginal habitat within the BSA. However, species was not observed during biological surveys.
Subtle Orache (<i>Atriplex subtilis</i>)	___/___/1B	Valley and foothill grassland (June-Aug/Oct).	<u>Low</u> : Sub-marginal grassland habitat present within the BSA.
Tehama navarretia (<i>Navarretia heterandra</i>)	___/___/4.3	Valley and foothill grassland (mesic). Vernal pools. (Apr-Jun)	<u>None</u> : No vernal pool habitat within BSA
Water star-grass (<i>Heteranthera dubia</i>)	___/___/2B	Alkaline marshes and swamps. Requires pH of 7 or higher in slightly eutrophic waters. (Jul-Oct)	<u>None</u> : No suitable alkaline marsh or swamp habitat is present within the BSA.
Watershield (<i>Brasenia schreberi</i>)	___/___/2B	Freshwater marshes and swamps. (Jun-Sep)	<u>Low</u> : Sub-marginally suitable freshwater habitat is present within the BSA.
Wine-colored Tufa Moss (<i>Plagiobryoides vinosula</i>)	___/___/4.2	Usually granitic rock or granitic soil along seeps and streams, sometimes clay.	<u>None</u> : No granitic soil habitat within BSA
Woolly meadowfoam (<i>Limnanthes floccosa</i> ssp. <i>floccosa</i>)	___/___/4	Edge of vernal pools at elevations of 375 to 400 meters. (Mar-Apr)	<u>None</u> : No vernal pool habitat within BSA
Woolly Rose-mallow (<i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i>)	___/___/1B.2	Marshes and swamps (freshwater). (Jun-Sep)	<u>Low</u> : Marginal habitat present within the BSA along. Species was not observed within the BSA.
INVERTEBRATES			
California Linderiella (<i>Linderiella occidentalis</i>)	___/___/___	Vernal pools, swales, and ephemeral freshwater habitat.	<u>None</u> : No vernal pool habitat within BSA
Conservancy Fairy Shrimp	FE/___/___	Moderately turbid, deep, cool-water vernal pools.	<u>None</u> : No vernal pool habitat within BSA.
Valley Elderberry Longhorn Beetle (<i>Desmocerus californicus dimorphus</i>)	FT/___/___	Blue elderberry shrubs usually associated with riparian areas.	<u>None</u> : No blue elderberry (the sole host plant of the species) were observed within the BSA.
Vernal Pool Tadpole Shrimp (<i>Lepidurus packardii</i>)	FE/___/___	Vernal pools, swales, and ephemeral freshwater habitat.	<u>None</u> : No vernal pool habitat present within BSA.
Vernal Pool Fairy Shrimp (<i>Branchinecta lynchi</i>)	FT/___/___	Vernal pools, swales, and ephemeral freshwater habitat.	<u>None</u> : No vernal pool habitat present within BSA.

Common Name (Scientific Name)	Status Fed/State/ CNPS	Associated Habitats	Potential for Occurrence*
REPTILES AND AMPHIBIANS			
California Tiger Salamander <i>(Ambystoma californiense)</i>	FT/SSC/_	Vernal pools and seasonal ponds in grassland and oak savannah.	<u>None</u> : No vernal pool habitat present within BSA.
California red-legged Frog <i>(Rana draytonii)</i>	FT/_/_	Inhabits quiet pools of streams, marshes, and occasionally ponds.	<u>None</u> : Species is presumed extirpated from the Central Valley.
Foothill Yellow-legged Frog <i>(Rana boylei)</i>	_/SSC/_	Partly-shaded, shallow streams and riffles with cobble-sized substrate for egg-laying.	<u>None</u> : Sub-marginal substrate habitat and species not known to occur on the valley floor.
Giant Garter Snake <i>(Thamnophis gigas)</i>	FT/ST/_	Agricultural wetlands and other wetlands such as irrigation and drainage canals, low gradient streams, marshes, ponds, sloughs, small lakes, and their associated uplands.	<u>Known</u> : Highly suitable habitat present and known occurrences within BSA. Species was observed during biological surveys.
Northwestern Pond Turtle <i>(Actinemys marmorata marmorata)</i>	_/SSC/_	Associated with permanent ponds, lakes, streams, and irrigation ditches or permanent pools along intermittent streams.	<u>High</u> : Suitable aquatic habitat is present within the BSA.
FISH			
Central Valley Spring-Run Chinook Salmon <i>(Oncorhynchus tshawytscha)</i>	FT/ST/_	Sacramento River and tributaries.	<u>None</u> : No suitable riverine habitat present within the BSA.
Central Valley Steelhead <i>(Oncorhynchus mykiss)</i>	FT/_/_	Sacramento and San Joaquin Rivers and their tributaries.	<u>None</u> : No suitable riverine habitat present within the BSA.
Delta Smelt <i>(Hypomesus transpacificus)</i>	FT/_/_	Sacramento-San Joaquin Estuary	<u>None</u> : No estuary habitat is present within the BSA. Additionally, BSA is outside the known range for the species.
BIRDS			
Bald Eagle <i>(Haliaeetus leucocephalus)</i>	_/SE/_	Lakes, rivers, estuaries, reservoirs and some coastal habitats.	<u>Known</u> : No suitable nesting habitat present within the BSA. Suitable foraging habitat present within the BSA. Species was observed in January 2019.
Bank Swallow <i>(Riparia riparia)</i>	_/ST/_	Nests in steep riverbank cliffs, gravel pits, and highway cuts.	<u>None</u> : No suitable riverbank habitat present within the BSA.
Burrowing Owl <i>(Athene cunicularia)</i>	_/SSC/_	Nests in burrows in the ground, often in old ground squirrel burrows or badger, within open dry grassland and desert habitat.	<u>Low</u> : Sub-marginally suitable grassland habitat present within the BSA.
Aleutian Cackling Goose <i>(Branta hutchinsii leucopareia)</i>	Delisted/_/_	Nests on south-facing turf slopes above rocky cliff-bound shorelines. Winters in the Delta and northern San Joaquin Valley	<u>Low</u> : Sub-marginally suitable winter roosting habitat present within the BSA. Most Aleutian cackling geese winter west

Common Name (Scientific Name)	Status Fed/State/ CNPS	Associated Habitats	Potential for Occurrence*
			of the Sacramento River.
California Black Rail (<i>Laterallus jamaicensis coturniculus</i>)	___/ST/___	Yearlong resident of saline, brackish, and fresh emergent wetlands in the San Francisco Bay Area, Sacramento-San Joaquin Delta, coastal Southern California, the Salton Sea and lower Colorado River area.	<u>Low</u> : Sub-marginally suitable habitat present within the BSA.
Great Blue Heron (rookery) (<i>Ardea herodias</i>)	MBTA/___/ -	Common all year throughout California, in shallow estuaries and fresh and saline emergent wetlands. Nests in colonies in tops of secluded large snags or live trees.	<u>Low</u> : Suitable habitat is present. However, no heron rookeries were observed during biological surveys of the BSA.
Greater Sandhill Crane (<i>Grus canadensis tabida</i>)	___/ST/___	Wet meadows, shallow lacustrine, and fresh emergent wetland habitats. Winters in the Sacramento and San Joaquin Valleys.	<u>Moderate</u> : Suitable open habitat present and found adjacent to BSA.
Least Bell's Vireo (<i>Vireo bellii pusillus</i>)	FE/SE/___	Riparian forests, woodlands, scrubs.	<u>None</u> : No suitable riparian habitat present in the BSA.
Loggerhead Shrike (<i>Lanius ludovicianus</i>)	___/SSC/___	Open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low or sparse herbaceous cover	<u>Moderate</u> : Suitable foraging habitat present within the BSA.
Merlin (<i>Falco columbarius</i>)	___/___/___	Open conifer woodland, prairie groves; in migration, also foothills, marshes, open country. Generally, breeds in semi-open terrain having trees for nest sites and open areas for hunting. May winter in more open areas, such as grasslands, coastal marshes.	<u>Moderate</u> : Suitable foraging habitat present within the BSA. Species not known to nest in CA but winters in the area.
Northern Harrier (<i>Circus cyaneus</i>)	___/SSC/___	Meadows, grasslands, open rangelands, desert sinks, fresh and saltwater emergent wetlands	<u>Known</u> : Species observed within BSA
Osprey (<i>Pandion haliaetus</i>)	MBTA/ SSC/___	Wetland, open water.	<u>Moderate</u> : Marginal open habitat present and found adjacent to BSA.
Song Sparrow (Modesto Population) (<i>Melospiza melodia</i>)	___/SSC/___	Emergent freshwater marshes, riparian willow thickets, vegetated irrigation canals.	<u>Moderate</u> : Marginally suitable habitat is present within the BSA.
Swainson's Hawk (<i>Buteo swainsoni</i>)	___/ST/___	Nests in isolated trees or riparian woodlands adjacent to suitable foraging habitat including grasslands or suitable grain or alfalfa fields, or livestock pastures.	<u>Moderate</u> : Suitable habitat is present within the BSA. Known occurrences in the vicinity of the BSA.
Tri-colored Blackbird (<i>Agelaius tricolor</i>)	___/SSC/___	Nests in dense blackberry, cattail, tules, willow, or wild rose within emergent wetlands throughout the Central valley and foothills surrounding the valley.	<u>Moderate</u> : Suitable habitat is present within the BSA and known occurrences within the vicinity.
Western Yellow-billed Cuckoo (<i>Coccyzus americanus occidentalis</i>)	FT/SE/___	Structured dense riparian forest, generally willows.	<u>None</u> : No suitable riparian forest habitat present within the BSA.
Yellow Warbler (<i>Setophaga petechia</i>)	___/SSC/___	Very partial to riparian woodlands of the lowlands and foothill canyons.	<u>None</u> : No suitable riparian habitat present within the

Common Name (Scientific Name)	Status Fed/State/ CNPS	Associated Habitats	Potential for Occurrence*
			BSA.
Migratory Birds and Raptors	MBTA	Nest and forage in a variety of habitats including hardwood woodlands, coniferous forests, meadows, grasslands and riparian.	<u>Known</u> : Species protected by the MBTA were observed within the BSA.
MAMMALS			
American Badger (Taxidea taxus)	_/SSC/_	Grasslands, savannahs, and mountain meadows with friable soils.	<u>None</u> : No suitable habitat present within the BSA.
Hoary Bat (Lasiurus cinereus)	_/_/_	Roosting habitat includes woodlands and forests with medium to large-sized trees and dense foliage. Adjacent open areas are required for feeding.	<u>None</u> : No suitable roosting habitat is present within the BSA.
North American porcupine (Erethizon dorsatum)	_/_/_	Coniferous, deciduous and mixed forests. Prefers scrubby areas	<u>None</u> : No suitable habitat present within the BSA.
Silver-haired Bat (Lasionycteris noctivagans)	_//_/_	Coniferous and mixed deciduous forest as well as riparian areas.	<u>None</u> : No suitable deciduous forest habitat present within the BSA.
Western Red Bat (Lasiurus blossevillei)	_/SSC/_	Roosting habitat includes forest and broadleaf woodlands from sea level to coniferous forest. Feeds over grasslands, shrublands, open woodlands, and croplands. Known to occur from Shasta County to the Mexican border – often in riparian habitats.	<u>None</u> : No suitable broadleaf forest is present within the BSA.
<u>CODE DESIGNATIONS</u>			
FE = Federally-listed Endangered FT = Federally-listed Threatened FC = Federal Candidate Species BCC = Federal Bird of Conservation Concern MBTA = protected by the federal Migratory Bird Treaty Act SE = State-listed Endangered ST = State-listed Threatened SH = Presumed extinct in California		SSC = CDFW Species of Special Concern FP = CDFW Fully Protected Species SNC = CDFW Sensitive Natural Community CNPS 1B = Rare or Endangered in California or elsewhere CNPS 2 = rare or Endangered in California, more common elsewhere CNPS 3 = More information is needed CNPS 4 = Plants with limited distribution	
<p>*Potential for occurrence: for plants it is considered the potential to occur during the survey period; for birds and bats it is considered the potential to breed, forage, roost, over-winter, or stop-over in the BSA during migration. Any bird or bat species could fly over the BSA, but this is not considered a potential for occurrence. The categories for the potential for occurrence include:</p> <p><u>None</u>: The species or natural community is known not to occur, and has no potential to occur in the BSA based on sufficient surveys, the lack of suitable habitat, and/or the BSA is well outside of the known distribution of the species.</p> <p><u>Low</u>: Potential habitat in the BSA is sub-marginal and the species is not known to occur in the vicinity of the BSA. Protocol-level surveys are not recommended.</p> <p><u>Moderate</u>: Suitable habitat is present in the BSA and the species is known to occur in the vicinity of the BSA.</p> <p><u>High</u>: Habitat in the BSA is highly suitable for the species and there are reliable records close to the BSA, but the species was not observed.</p> <p><u>Known</u>: Species was detected in the BSA or a recent reliable record exists for the BSA.</p>			

Only species with at least moderate potential of occurring within the BSA are discussed in the following section. Species with no or a low potential to occur within the BSA are not discussed further because the potential for these species to occur is negligible.

4.5.1 *Plants*

A majority of the BSA is heavily disturbed agricultural areas dominated by rice resulting in a lack of suitable habitat for many of the special-status plant species listed in **Table 3**. Additionally, canal maintenance activities would limit the potential habitat for a number of aquatic special-status species. No special-status plant species were determined to have potential to occur within the BSA due to on-going adjacent agricultural activities and continued canal maintenance activities.

4.5.2 *Reptiles and Amphibians*

Two special-status reptile species were determined to have at least moderate potential to occur within the BSA, giant garter snake and northwestern pond turtle. No other special-status reptile or amphibian species were determined to have potential to occur.

Giant Garter Snake

The giant garter snake is a federal and state listed threatened species endemic to the wetlands of the Sacramento and San Joaquin Valleys of California. The giant garter snake prefers the high-quality natural wetlands which include marshes, ponds, small lakes, low-gradient streams with silty substrates, and managed wetlands. Additionally, it has become readily apparent giant garter snakes inhabit agricultural wetlands and other associated waterways such as irrigation and drainage canals, sloughs, and adjacent uplands in the Central Valley. Because of the direct loss of natural habitat, GGS now relies on rice farming in the Sacramento and San Joaquin Valley, but also uses managed marsh areas in federal national wildlife refuges and state wildlife areas. Giant garter snakes are typically absent from larger rivers with sand, rock and gravel substrates, wetlands with sand, gravel, or rock substrates due to a lack of habitat and emergent vegetation. Riparian woodlands typically do not provide suitable habitat because of excessive shade, lack of basking sites, and absence of prey populations (USFWS 2006). The GGS is active from early spring (April-May) through mid-fall (October-November), although this period of activity varies based on weather. During the winter they are much less active and rarely emerge from burrows. When active, the species usually remains near wetland habitat, although they can move up to 0.8 km in a day (USFWS 1999).

The loss and fragmentation of habitat is the leading threat to GGS throughout the range of the species. Habitat loss has occurred from urban expansion, agricultural conversion, and flood control. Fragmentation limits dispersal and isolates populations of the giant garter snake, increasing the likelihood of inbreeding, decreasing fitness, and reducing genetic diversity. Some populations of the giant garter snake are subject to the cumulative effects of a number of other existing and potential threats, including roads and vehicular traffic, predation by non-native species and climate change.

Primary habitat requirements consist of 1) adequate water during the snake's active season (early-spring through mid-fall) to provide food and cover; 2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat during the active season; 3) grassy banks and openings in waterside vegetation for basking; and 4) higher elevation uplands for cover and refuge from floodwaters during the snake's dormant season in the winter (USFWS 2006).

According to the USFWS Recovery Plan for the Giant Garter Snake released in 2017, habitat components include; 1) a fresh water component with protective emergent vegetative cover that will allow foraging, 2)

An upland component near the aquatic habitat that can be used for thermoregulation and for summer shelter in burrows, and 3) An upland refugia component that will serve as winter hibernacula. Further, researchers and experts acknowledge qualitative components for ideal aquatic and upland habitat. Ideal aquatic habitat has 1) water present from March through November; 2) slow moving or static water flow with mud substrate, 3) the presence of emergent bankside vegetation that provides cover from predators and may serve in thermoregulation, 4) the absence of a continuous canopy of riparian vegetation, 5) available prey in the form of small amphibians and small fish, 6) thermoregulation sites with supportive vegetation such as folded tule clumps immediately adjacent to escape cover, 7) the absence of large predatory fish, and 8) the absence of recurrent flooding, or where flooding is probable the presence of upland refugia. Ideal upland habitat contains, 1) available bankside vegetative cover, typically tule or cattail, for screening from potential predators, 2) available permanent shelter, such as bankside cracks or crevices, holes, or small mammal burrows and 3) free of poor grazing management practices (i.e., grazing to the point at which giant garter snake refugia has been reduced or eliminated). An important portion of the upland component is upland refugia for the winter months when the snakes bromate and enter a lethargic state similar to mammalian hibernation. Over-wintering sites generally consist of mammal burrows along canal or marsh banks, or rock slope protection along roadways or canal edges.

Giant garter snakes feed primarily on small fish, tadpoles, and frogs. The GGS inhabits small mammal burrows and other soil crevices above prevailing flood elevations throughout its winter dormancy period. The snakes typically select burrows with sunny exposure along south and west facing slopes. The breeding season extends through March and April, and females give birth to live young from late July through early September. Brood size is variable, ranging from 10 to 46 young, with a mean of 23 (Hansen and Hansen, 1990). Young immediately scatter into dense cover and absorb their yolk sacs, after which they begin feeding on their own. Although growth rates are variable, young typically more than double in size within the first year; sexual maturity averages three years for males and five years for females (Hansen and Hansen, 1990).

The project area meets all the essential GGS habitat components, as set forth in the November 13, 1997 USACE Programmatic Formal Consultation for GGS within the Northern California counties, including Butte County. In addition to the habitat components set forth in the USFWS Recovery Plan.

The BSA contains adequate water year around due to the regulated irrigation within the BSA. Rice fields are available adjacent to the District's canals during the snake's active season creating an alternative aquatic habitat for the species to utilize. Additionally, emergent vegetation in the form of tule, cattail, or water primrose is present in portions of the canal which provides suitable aquatic habitat for the species to forage, thermoregulate, and escape predators.

Many sites within the BSA contain bankside vegetation that creates a protective screen against predators. Permanent shelters are available in the form of bankside cracks, crevices, holes, and small mammal burrows. Additionally, manmade structures present within the BSA could be utilized for shelter such as open spaces between rock slope protection and the back sides of structures.

The higher elevation uplands do contain refugia, which the snake inhabits during winter months. Several types of refugia are commonly encountered along the District's canals including mammal burrows, rock slope protection near structures, and crevices alongside conveyance structures.

Three GGS were detected during surveys conducted by NorthStar and Swaim biologists. Additionally, the CNDDDB contains three records of GGS within one mile of the overall project footprint. These include a record of a female captured in 1998 at the junction of Richvale East Road and Butler Canal, a record of an individual collected in 1942 about two miles north of Richvale, and three individuals captured about 3.7 miles west-southwest of Richvale in 2013. Approximately 14 additional GGS records occur within five

miles of the project footprint, most of which are located to the north or west of the project. Each of these occurrences near the project area may be comprised of multiple GGS individuals.

GGH Habitat Assessment

Swaim Biological, Inc. prepared a habitat assessment for the proposed project to address the suitability of habitats present within the BSA, the potential impacts to habitat present, and recommended avoidance and minimization to reduce potential impacts to habitat. The Habitat Assessment is included as Appendix F.

For this assessment, habitat evaluation criteria were identified based on recognized minimum ecological requirements for GGS (USFWS 2006). During the visual habitat assessment, the criteria at each site were assigned a numerical score and using the cumulative total, each site was classified as containing either unsuitable, marginal or suitable GGS habitat. The results of the assessment are shown in a series of maps illustrating habitat value by colored code for each improvement site based on habitat variables within and around the project area.

On August 9, 2018 and January 23, 2019, biologists conducted field surveys at all the work locations in order to characterize the habitat present and assess its potential to support the GGS. During the surveys, habitat was evaluated at each site, and characteristics were recorded on a worksheet using a list of 15 variables associated with GGS presence. The information was then entered in a database to calculate the cumulative habitat scores for each site. Scoring methodologies were adopted from the USFWS 1999 Draft Recovery Plan for the Giant Garter Snake (Appendix D: Page 157) and were modified based on the project components and field conditions. The modified habitat assessment score sheet and instructions for completing the form are included as appendices to this assessment (Appendix B). Representative photographs of project features and GGS are provided in Appendix C.

Assessed areas included aquatic and upland habitat features, including interconnected ditches, drains, channels or swales within 50 feet of identified features of the customer turnouts. Variables associated with the presence of prey or introduced fish were estimated by the relative size and hydrological connectivity of the aquatic habitat. Habitat classification break points were based upon recognized habitat characteristics of GGS and their life history, distribution, and habitat requirements. Habitat was assessed using the following guidelines:

GGH Habitat Assessment Results

Impacts to Suitable Habitat

Seven of the 12 improvement sites evaluated were determined to contain suitable GGS habitat. Of the sites located in suitable habitat for GGS, three have planned improvements which include the construction of a total of concrete-lined sections that will result in permanent impacts. Project activities in those areas are anticipated to result in temporary impacts to 0.77 acres of suitable GGS upland and aquatic habitat and permanent impacts to approximately 0.12 acres of suitable aquatic GGS habitat (**Table 4**).

Most of the project area contained suitable GGS habitat and included a combination of water canals, ditches, drains, flooded rice fields and upland banks that comprises the water conveyance infrastructure. These habitat areas contained features necessary to support permanent GGS populations through the proximity with flooded rice fields and associated irrigation canals, which allowed for sufficient water during the active summer season to supply cover and prey items such as small fish and amphibians. The presence of adjacent perennial wetlands and/or ponds near some of these sites further enhanced their habitat value. Improvement sites within suitable GGS habitat were found throughout the project area including, but not limited to, Ollie's Weir, Humpy West, Humpy South, and Humpy Weir. Based on their habitat characteristics and the known presence of GGS in the project vicinity, all of the habitat

improvement sites containing suitable habitat have a strong likelihood of being occupied by GGS on a relatively permanent basis.

Impacts to Marginal Habitat

Five of the work locations were determined to contain marginal GGS habitat. Of these sites, two have planned improvements that will require ground disturbance. Project activities in those areas are anticipated to result in temporary impacts to 0.14 acres of marginal GGS habitat and permanent impacts to approximately 60 ft² of marginal GGS habitat.

Within the project area, sites that were classified as marginal contained only a minimal amount of the water, vegetation, and refugia required to sustain GGS. In the marginal habitat sites, work areas may have been near permanent water courses and rice fields but were also near orchards or other land uses not suitable for GGS populations. Improvement sites with marginal habitat may have had adequate water present but lacked either emergent, herbaceous aquatic vegetation or vegetated banks that provide basking and refugia. At some of the improvement sites with marginal habitat, water channels contained more riparian habitat with high canopies or concrete-lined canals, or bankside woody or densely vegetated banks that do not provide sunny basking sites. Marginal habitat usually had minimal bankside burrows and crevices that provide short-term aestivation sites, and unsuitable sites were typically missing seasonal GGS aquatic habitat and contained only degraded upland habitat, e.g., adjacent to orchards and other incompatible land types.

Marginal GGS habitat within the project area was generally found closer to developments associated with the community of Richvale, and the upland habitat tended to include residential or orchard land cover. These areas included Bradford Lateral and Peterson Lateral.

Improvement sites determined to contain marginal habitat may have had adequate water present but lacked either emergent, herbaceous aquatic vegetation or vegetated banks that provide basking and refugia. Based on their habitat characteristics and the known presence of GGS in the project vicinity, the habitat improvement sites containing marginal habitat, if used by GGS, are likely to be occupied only on a temporary basis.

Impacts to Unsuitable Habitat

None of the work locations for this assessment are located in unsuitable habitat.

Table 4. Estimated total area of temporary and permanent impacts to suitable GGS habitat.

Improvement Site	Temporary Upland Impacts	Temporary Aquatic Impacts	Permanent Upland Impacts	Permanent Aquatic Impacts
Ollies Weir/Humpy West/Humpty Weir	2,525	6,480	263	930
Humpy South	1,850	6,240	675	840
Mixing Box	4,350	11,920	1,175	1,470
TOTAL (sq. ft.)	8,725	24,640	2,113	3,240
TOTAL (acres)	0.20	0.57	0.05	0.07
	0.77		0.12	

Impact area estimates provided by Davids Engineering.

Assessment Summary

This assessment classified habitat within and adjacent to project work locations for its suitability to support GGS and identified impacts associated with project activities in order to evaluate the overall project impacts to the species. Several of the work locations assessed contained suitable GGS habitat, and for sites containing suitable habitat where ground disturbance will occur, there is a substantial risk that project activities will result in direct or indirect effects to GGS. In all, seven sites were determined to contain suitable GGS habitat, but only three of these are located in areas where ground disturbance is anticipated to occur. Activities at these sites will result in 0.77 acres of temporary impacts (0.20 and 0.57 acre in upland and aquatic habitat, respectively), and 0.25 acres of permanent impacts (0.18 and 0.07 acre in upland and aquatic habitat, respectively).

At work locations where activities are planned to occur in suitable GGS habitat but where no ground disturbance is required, it is likely that effects to GGS can be avoided during project activities by implementing conservation measures to avoid and minimize impacts (described below). Likewise, in areas containing marginal GGS habitat the incorporation of conservation measures into the project are anticipated to reduce the risk of impacts to GGS to a low level.

Northwestern Pond Turtle

The northwestern pond turtle can be found throughout California and is the only abundant native turtle in California. They are associated with permanent or nearly permanent water in a wide variety of habitats at elevations ranging from near sea level to 4,700 feet. They require basking sites including partially submerged logs, rocks, mats of floating vegetation, or open mud banks. The northwestern pond turtle hibernates in colder areas underwater on muddy bottoms. Nesting sites are typically constructed along the banks of permanent water in soils at least 10 cm deep and must have high internal humidity for eggs to develop and hatch (Jennings and Hayes 1994).

The canals within the BSA provide suitable aquatic habitat for the species. Additionally, the upper banks of the canals could provide suitable nesting habitat for the species. The nearest known occurrences are found in Gold Run Creek and near the Thermalito Afterbay along the Feather River, additionally the

species is found in the Upper Butte Basin Wildlife Area and along Butte Creek west of Richvale. The species was not observed during biological surveys of the BSA.

4.5.3 Fish

No special-status fish species have potential to occur within the BSA due to the lack of suitable stream and riverine habitats present within project work areas on the site. The nearest suitable riverine habitat is present within Butte Creek approximately two miles west of the BSA.

4.5.4 Birds

The BSA contains potentially suitable habitat for bald eagle (*Haliaeetus leucocephalus*), sandhill crane (*Antigone canadensis*), Swainson's hawk (*Buteo swainsoni*), loggerhead shrike (*Lanius ludovicianus*), merlin (*Falco columbarius*), northern harrier (*Circus hudsonius*), osprey (*Pandion haliaetus*), song sparrow (*Melospiza melodia*), tricolored blackbird (*Agelaius tricolor*), as well as a number of migratory birds and raptors protected by the Migratory Bird Treaty Act (MBTA).

Bald eagle

The bald eagle is known from Alaska to California and in California it is a permanent resident, now restricted to breeding mostly in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity Counties. Bald eagles are also found in a few favored inland waters in Southern California. They are more common at lower elevations, and are not found in the high Sierra Nevada. They require large bodies of water or free flowing rivers with abundant fish, and adjacent snags or other perches. Bald eagles will occasionally forage in flooded fields for displaced voles or other small mammals. They will also scavenge dead fish, water birds, and mammals, and have been known to steal from osprey. Typically nests within 1.6 km (1 mile) of water in large, old-growth, or dominant live trees with open branchwork (less than 40% canopy). Nests are usually located 16-61 m (50-200 feet) above the ground. Breeding occurs from February to July; however, they don't begin nesting if human disturbance is evident.

There were no bald eagle nests discovered during biological surveys of the BSA, however, the species was observed foraging within the BSA during January of 2019. It is not expected the species would nest within the BSA due to its distance from a large body of water such as the Sacramento River or Lake Oroville. The species is regularly seen during the winter months when they come into the Central Valley following migrating waterfowl.

Greater sandhill crane

The greater sandhill crane is a state threatened species that can be found in open habitats with scattered shrubs, bogs, marshes, and prairies across northern North America and the southeastern United States. Typically, they winter in immense flocks in Bosque del Apache, New Mexico, and the Anahuac National Wildlife Refuge, Texas. Greater sandhill cranes are omnivores that eat insects but will also take small birds, mammals, amphibians, reptiles, and fish. Nesting occurs in wetlands with vegetated areas. (Cornell lab 2017). In northern California, greater sandhill cranes nest in northeastern California and winter in the Central Valley where they are found readily in agricultural areas where they will forage on waste grain rice. The species arrives in the Central Valley in mid-October and depart by March or April to nesting grounds.

Greater sandhill crane is not expected to nest within the BSA, but is expected to occur within the Central Valley. Sandhill cranes were observed during biological surveys of the BSA during January 2019, they could not be readily identified to subspecies due to distance from observers.

Loggerhead shrike

The loggerhead shrike is a common resident and winter visitor in lowlands and foothills throughout California. They can be found in open habitats with scattered shrubs, trees, posts, fences, utility lines or other perches. Typically, they occur in open canopied valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, pinyon-juniper, juniper, desert riparian, and Joshua tree habitats. They rarely occur in heavily urbanized areas but are often found in open croplands. Loggerheaded shrikes mainly eat large insects, but also take small birds, mammals, amphibians, reptiles, fish, carrion, and various other invertebrates. They nest in shrubs or trees at heights ranging from 0.4 to 15 meters above the ground. Adults lay eggs from March to May with male and females tending their young into July or August.

The areas surrounding Richvale provide suitable open habitat for the species. It is not expected the species would nest within the Central Valley but the species would be expected to be found foraging within the area during the winter months. The species was not observed during biological surveys of the BSA.

Merlin

The merlin is a small, stocky falcon with a blocky head. In general, the species is dark overall with a broadly striped chest although their coloration varies geographically and by gender. The merlin nests in forested openings, edges and along rivers across northern North America. During migration and in the winter the species can be found in open areas, open forests, grasslands, and coastal areas. The species is a dynamic predator that feeds primarily on small birds but will also supplement its diet with small mammals and insects.

The species does not breed in California and is an uncommon winter migrant from approximately September to May. Numbers have declined markedly in California in recent decades. The species will not be found during the breeding season within the BSA but it is possible it could occur during the winter months as suitable foraging habitat is present within the BSA. The species was not observed during biological surveys of the BSA.

Northern harrier

Northern harriers are a raptor commonly found near wetlands and open grasslands perched on or flying close to the ground. The northern harrier is one of the few birds of prey that is frequently polygynous when ecological conditions permit. Nests are constructed on the ground, typically in dense, low vegetation that provides a visual barrier and cover. In drier habitats, the nest consists of a loose, thin layer of sticks. In wetter situations, nests are larger, more substantial structures. Nests are built by the female and typically consist of grass, reeds, and small sticks. Breeding activity begins in April, concluding in September, with a peak in activity from June to July. A single brood of four to six eggs are incubated by the female. Incubation begins with the last egg and lasts about 29–39 days. The female broods the young for about 4 weeks while the male provisions the female and young with prey items. Young begin to leave the nest, moving around into the surrounding vegetation, at about 2 weeks of age. The amount of time spent at the nest steadily decreases after this point until fledging. First flight generally occurs at 29–34 days of age. Young remain in the vicinity of the nest until dispersal.

Northern harrier was observed regularly during biological surveys of the BSA. The species was commonly seen in the agricultural areas of the BSA foraging over rice, converted wetland, and marsh habitat.

Swainson's hawk

Swainson's hawk is listed as Threatened under the California Endangered Species Act (CESA). It is a long-distance migrant with nesting grounds in western North America. Swainson's hawks arrive in the Central Valley between March and early April to establish breeding territories. Breeding occurs from late March to late August, peaking in late May through July (Fitzner 1980).

The Swainson's hawk nests in isolated trees, small groves, or large woodlands, adjacent to open grasslands or agricultural fields. This species typically nests near riparian areas; however, it has been known to nest in urban areas as well. Nest locations are usually in close proximity to suitable foraging habitats, which include grasslands, fallow fields, irrigated pastures, alfalfa and other hay crops, and low-growing row crops. Swainson's hawks primarily prey upon small rodents such as ground squirrels (*Spermophilis* spp.), pocket gophers (*Thomomys* spp.), voles (*Microtus* spp), but insects, reptiles, and birds may be consumed as well (Snyder and Wiley 1976; Fitzner 1980; Estep 1989). Swainson's hawks leave their breeding grounds to return to their wintering grounds in late August or early September (Bloom and DeWater 1994). Swainson's hawks' largest threats are loss of habitat and secondary poisoning from insecticides on their wintering grounds (Woodbridge et al. 1995a).

The large trees present within the BSA could provide suitable nesting habitat for Swainson's hawk additionally, fallowed fields may provide suitable foraging habitat for the species. The nearest known occurrences for the species are found along the Cherokee Canal and Butte Creek to the north and west of the proposed project location. No Swainson's hawk nests were observed during biological surveys of the BSA nor was the species observed.

Osprey

The osprey is a migratory raptor species that feeds almost exclusively on live fish. Foraging in clear, open waters, osprey dive feet first to catch their prey. This species is considered a Species of Special Concern by CDFW, despite recent population increases following the elimination of pesticide use such as DDT, which caused population decline during the 1950s and up to 1970. Osprey populations appear to be increasing since the 1970s. Nests are constructed from sticks to form platforms on top of dead-topped trees, cliffs, man-made structures (i.e. cell phone and utility towers), and occasionally on the ground. Ospreys arrive on nesting grounds mid-March to early April and lay between 1-4 eggs. Southern migration occurs in October, with osprey flying along the coast and western slopes of Sierra Nevada in October to Central and South America (CDFG 2005).

No large osprey nests were observed within the BSA; however, suitable nesting habitat is present within the larger Fremont cottonwoods found along the Cherokee Canal.

Song sparrow (Modesto Population)

The Modesto population is a subspecies of song sparrow and is a California species of special concern. It is endemic to California and lives only in the north-central portion of the Central Valley. The highest densities occur in the Butte Sink in Butte County, and along the Sacramento-San Joaquin Delta. Breeding records exist for Butte, Colusa, Sutter, Sacramento, and San Joaquin counties. While it is still common in some areas, it is believed that large-scale loss of wetland and riparian habitat has caused population decline and extirpation in other areas. The sparrow is found in emergent freshwater marshes, riparian willow (*Salix* spp.) thickets, and valley oak forests with a blackberry understory, and sometimes along vegetated irrigation canals and levees. It breeds from mid-March to early August. (Shuford and Gardali 2008; Humple and Geupel 2004). In general, song sparrows are small with a short bill and brown streaking on a white chest and flanks (Cornell Laboratory of Ornithology 2016). The sparrow's diet consists primarily of seeds for much of the year, but insects become increasingly important, reaching

more than 70 percent of its diet in May. Habitat loss and fragmentation—as well as nest predation by several species of mammals, snakes, and birds, including feral domestic cats—pose threats to the sparrow (Shuford and Gardali 2008; Humple and Geupel 2004).

There are no distinctive differences in appearance between song sparrows that allow absolute visual identification of a song sparrow as being part of the “Modesto population.” Although designation as subspecies for the “Modesto” song sparrow is pending further research, it is recognized as such and has been listed as a California SSC.

Emergent habitat within the canals found in BSA appears suitable and similar to areas where individuals of the Modesto population are typically found. The species was not observed during biological surveys of the BSA.

Tricolored blackbird

Tricolored blackbird is a state threatened species under the California Endangered Species Act (CESA). The tri-colored blackbird occurs throughout California’s Central Valley and in coastal habitats from Sonoma County south. The tri-colored blackbird requires dense fresh emergent wetlands to nest and breed, and forages in grassland and cropland habitats. Its nests are made from mud and plant materials and colonies can consist of 50 pairs to as large as 30,000 pairs. Tri-colored blackbirds require open, accessible water, protective nesting substrates (flooded, thorny, or spiny vegetation), and suitable foraging space within a few miles of the nesting colony. In response to loss of fresh emergent wetland habitat, tri-colored blackbirds have been increasingly observed to utilize Himalayan blackberry (*Rubus armeniacus*), elderberry, poison oak (*Toxicodendron diversilobum*), and grain fields for colony establishment.

The habitats present in the BSA provide large areas of suitable foraging habitat for the species. Additionally, the BSA provides suitable nesting habitat for the species as Himalayan blackberry and emergent vegetation can be found along the District’s canals. No active tri-colored blackbird colonies were observed during biological surveys of the BSA. Many of the occurrences found in the vicinity of Richvale have been determined to be possibly extirpated. Most of the occurrences are from the 1930s and during re-surveys in 2011 no birds were observed.

Migratory Bird Species

Migratory birds are protected in varying degrees under California Fish and Game Code, Section 3503.5, the MBTA, and California Environmental Quality Act. The project site currently provides suitable nesting and/or foraging habitat for a number of species that would be protected by the MBTA. Virtually every habitat type within the BSA supports migratory bird species protected by the MBTA. Cliff swallows (*Petrochelidon pyrrhonota*) and barn swallows (*Hirundo rustica*) were observed nesting on concrete structures along the canals.

4.5.5 *Mammals*

No special-status mammal species have potential to occur within the BSA due to the lack of suitable roosting habitat for bat species.

4.6 Waters of the United States

Waters of the United States (WOUS), as defined by the Clean Water Rule (CWR) (33 CFR Part 328) are found within the BSA in the form of tributaries. The canals that make up the water transport system within the BSA are considered tributaries, as defined by the CWR because they 1) contribute flow, both directly and through other WOUS to waters identified as WOUS; 2) are characterized by the presence of

the physical indicators of a bed and banks and an Ordinary High Water Mark (OHWM); and 3) possesses a significant nexus, in that in combination with one another, the canals that make up the irrigation district significantly affects the chemical, physical, and biological integrity of receiving identified WOUS by providing the benefits of: (i) sediment trapping, (ii) nutrient recycling, (iii) pollutant trapping, transformation, filtering, and transport, (iv) retention and attenuation of flood waters, (v) runoff storage, (vi) contribution of flow, (vii) export of organic matter, (viii) export of food resources, and (ix) provision of life cycle dependent aquatic habitat (such as foraging, feeding, nesting, breeding, spawning, or use as a nursery area) for species located in a water identified as a WOUS.

The canals within the BSA are classified as WOUS in the form of tributaries. The canals are generally earthen lined with some exceptions where they are concrete lined, the main canals can be relatively wide in some cases where top of bank to top of bank widths are close to or exceeding 40 feet. Many of the District's laterals are much narrower with widths varying between a few feet to approximately 20 feet wide. Depths are variable with the main canals being deeper and the laterals being shallow. Though considered WOUS, improvements in the form of maintenance and construction within the BWGWD Irrigation Canal System are exempt from the requirements of Section 404, and subsequently Section 401 of the CWA, secondary to the issuance of Regulatory Guidance Letter 07-02.

A discussion of relevant laws that govern WOUS to date and activities within them may be found in sections 5.1.3, 5.1.4.1, and 5.1.4.2 below. Addressed in these sections are terms such as WOUS, OHWM, tributary(ies), and significant nexus as well as a list of activities allowed by RGL 07-02.

5. REGULATORY FRAMEWORK

The following describes federal, state, and local environmental laws and policies that are relevant to the California Environmental Quality Act (CEQA) review process.

5.1 Federal Regulations

5.1.1 Federal Endangered Species Act

The United States Congress passed the federal ESA in 1973 to protect those species that are endangered or threatened with extinction. The ESA is intended to operate in conjunction with the National Environmental Policy Act (NEPA) to help protect the ecosystems upon which endangered and threatened species depend.

Under the ESA, species may be listed as endangered, threatened, candidate, or proposed. An endangered species is in danger of extinction throughout all or a significant portion of its range. A threatened species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. "Candidate" species are species for which there is enough information to warrant proposing them for listing, but that have not yet been proposed. "Proposed" species are those that have been proposed for listing, but have not yet been listed.

Section 9 of the ESA prohibits the "take" of a listed animal without a permit. "Take" is defined to include harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting or any attempt to engage in any such conduct. "Harm" is defined as "an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering." Under Section 7 of the ESA, federal agencies are required to consult with the USFWS or National Marine Fisheries Service (NMFS) if their actions, including permit approvals or funding, could adversely affect an endangered plant or wildlife species or its habitat, or could adversely affect designated

critical habitat. Through consultation and the issuance of a biological opinion, USFWS or NMFS can issue an incidental take statement allowing take of the species, provided the action will not jeopardize the continued existence of any federally listed species or result in the destruction or adverse modification of habitats of those species. Section 10 of the ESA provides for issuance of incidental take permits to private parties without a federal nexus provided a Habitat Conservation Plan (HCP) is developed.

5.1.2 *Migratory Bird Treaty Act Title 16 USC Section 703*

The federal Migratory Bird Treaty Act (MBTA) (16 USC §703) prohibits the killing of migratory birds or the destruction of their occupied nests and eggs except in accordance with regulations prescribed by the USFWS. The bird species covered by the MBTA includes nearly all of those that breed in North America, excluding introduced (i.e. exotic) species (50 Code of Federal Regulations §10.13).

5.1.3 *Clean Water Rule: Definition of “Waters of the United States”; Final Rule (33 CFR Part 328)*

On June 29, 2015, the EPA and USACE published the 2015 Clean Water Rule (CWR) in an effort to better define the scope of waters protected under the CWA, which was set to go into effect on August 28, 2015. However, CA was one of 13 states that sued to block the regulation in-state, thereby generating a stay placed on the rule by the U.S. Court of Appeals for the Sixth Circuit on October 9, 2015. The 2015 CWR stay was rescinded on February 28, 2017, with the signing of Executive Order 13778; which essentially instructed the EPA and USACE to 1) review the 2015 rule for consistency with the objectives of the executive order (i.e. “to increase CWA program predictability and consistency by increasing clarity as to the scope of “waters of the United States” federally regulated under the Act.”) and 2) “to issue a proposed rule rescinding or revising the 2015 Rule as appropriate and consistent with law.” The agencies issued a final rule, 83 FR 5200 (Feb. 6, 2018), adding an applicability date to the 2015 Rule, which resulted in several district court challenges. The U.S. District Court for the District of South Carolina granted summary judgment in favor of the plaintiffs and enjoined the Applicability Date Rule nationwide. In addition, on November 26, 2018, the U.S. District Court for the Western District of Washington vacated the Applicability Date Rule nationwide. As a result, the 2015 Rule is now in effect in 22 States, including CA.

According to 33CFR §328.3(b) the term “waters of the United States” (WOUS) includes “All tributaries” as defined under §328.3(c)(3) of identified waters. For tributaries to be considered Jurisdictional under the CWR, they must display an “Ordinary High Water Mark” (OHWM) and meet the qualifications of a “significant nexus”. Excerpts of relevant terminology pertinent to the project setting from *33 CFR 328.3(c) Definitions* are found below:

(3) *Tributary or Tributaries.* The terms *tributary and tributaries* each mean a water that contributes flow, either directly or through another WOUS (including impoundments) to a WOUS that is also characterized by the physical indicators of a bed and banks and an OHWM. These physical indicators demonstrate there is volume, frequency, and duration of flow sufficient to create a bed and banks and an OHWM, and thus, to qualify as a tributary. A tributary can be a natural, man-altered, or man-made water and includes waters such as rivers, streams, canals, and ditches not excluded by §328.3(b)(3). A water that otherwise qualifies as a tributary under this definition does not lose its status as a tributary if, for any length, there are one or more constructed breaks (such as bridges, culverts, pipes, or dams), or one or more natural breaks...so long as a bed and banks and an OHWM can be identified upstream of the break.

(5) *Significant Nexus.* The term *significant nexus* means that a water, including wetlands, either alone or in combination with other similarly situated waters in the region, significantly affects the chemical, physical, or biological integrity of an identified WOUS. The term “in the region” means the watershed that drains to the nearest WOUS. Waters are similarly situated when they function alike and are sufficiently close to function together in affecting downstream waters. A water has a significant nexus

when any single function or combination of functions performed by the water, alone or together with similarly situated waters in the region, contributes significantly to the chemical, physical, or biological integrity or the nearest identified WOUS. Functions relevant to the significant nexus evaluation are the following:

- i. Sediment trapping,
- ii. Nutrient recycling,
- iii. Pollutant trapping, transformation, filtering, and transport,
- iv. Retention and attenuation of flood waters,
- v. Runoff storage,
- vi. Contribution of flow,
- vii. Export of organic matter,
- viii. Export of food resources, and
- ix. Provision of life cycle dependent aquatic habitat (such as foraging, feeding, nesting, breeding, spawning, or use as a nursery area) for species located in a water identified as a WOUS.

(6) *Ordinary High Water Mark*. The term *OHWM* means the line on the shore (bank) established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

5.1.4 *Clean Water Act (Title 33 U.S.C. §1251)*

5.1.4.1 Section 404 Clean Water Act

The purpose of the Clean Water Act (CWA) is to “restore and maintain the chemical, physical, and biological integrity of the nation’s waters.” Section 404 of the CWA prohibits the discharge of dredged or fill materials into Waters of the United States (WOUS) including wetlands, without a permit from the USACE. Additionally, Section 401 of the CWA (33 USC 1341) requires any applicant for a federal permit to conduct any activity that may result in the discharge of a pollutant into WOUS, to obtain certification that the discharge will comply with the applicable water quality standards. A CWA Section 401 Water Quality Certification is required when a Section 404 permit action occurs; the 401 certification is issued by the California Regional Water Quality Control Board (RWQCB).

The USACE may issue either individual permits on a case-by-case basis or general permits on a program level. General permits are pre-authorized and are issued to cover similar activities that are expected to cause only minimal adverse environmental effects. Nationwide permits are general permits issued to cover particular fill activities. All nationwide permits have general conditions that must be met for the permits to apply to a particular project, as well as specific conditions that apply to each nationwide permit and region within the nation.

CWA §404(f) provides a list of Section 404 regulation exempt activities. A project involving the discharge of material into WOUS, so long as it falls into an exempt category, would not require permitting. Construction and maintenance of irrigation ditches is included in exempt Activity No. 3, however, determination of ditch type was not well defined within the law. In an effort to “provide a reasonable and predictable national approach for conducting exemption determinations for the construction and maintenance of irrigation ditches”, the USACE issued Regulatory Guidance Letter (RGL) No. 07-02 on July 4, 2007; which remains valid until rescinded.

RGL 07-02 defines the term “Irrigation Ditch” as “a man-made feature and/or an upland swale that either conveys water to an ultimate irrigation use or place of use, or that moves and/or conveys irrigation water (e.g., “run-off” from irrigation) away from irrigated lands. Irrigation ditches may include the distribution system or parts thereof, consisting of manmade canals, laterals, ditches, siphons, and/or pipes, or pump

systems. If a ditch carries only irrigation water, irrigation return flows, and overland flow (precipitation and/or snowmelt) that moves from an irrigated field either to or away from an area subject to irrigated agriculture (e.g., an irrigated field), that ditch would be considered an irrigation ditch, not a drainage ditch.” This RGL also defines activities that qualify as either “Maintenance” or “Construction”, thereby qualifying for the exemption. According to RGL 07-02,

“Construction includes new work or work that results in an extension or expansion of an existing structure. Ditch construction generally includes, but is not limited to, activities such as:

- *Ditch relocation.*
- *Ditch conversion into pipe.*
- *Lining, which means placing impervious material such as concrete, clay, or geotextile within the flow perimeter of an open canal, lateral, or ditch with the intent of reducing seepage losses and improving conveyance efficiency. All new lining of ditches, where the ditch had not previously been lined, is considered construction.*
- *Placement of new control structures.*

Maintenance includes a repair to an existing structure or feature to keep the ditch in its existing state or proper condition, or to preserve it from failure or decline. Maintenance generally includes, but is not limited to, activities such as:

- *Excavation of accumulated sediments back to original contours*
- *Re-shaping of the side-slopes.*
- *Bank stabilization to prevent erosion where reasonably necessary using best management practices.*
- *Armoring, lining and/or piping. These activities qualify as maintenance only where a previously armored, lined, or piped section is being repaired and all work occurs within the footprint of the previous work.*
- *Replacement of existing control structures, where the original function is not changed and original approximate capacity is not increased.”*

5.1.4.2 Section 401 Clean Water Act

Clean Water Act (§401) requires water quality certification and authorization for placement of dredged or fill material in wetlands and Other Waters of the United States. In accordance with the Clean Water Act (§401), criteria for allowable discharges into surface waters have been developed by the State Water Resources Control Board (SWRCB), Division of Water Quality. The resulting requirements are used as criteria in granting National Pollutant Discharge Elimination System (NPDES) permits or waivers, which are obtained through the Regional Water Quality Control Board (RWQCB). Any activity or facility that will discharge waste (such as soils from construction) into surface waters, or from which waste may be discharged, must obtain an NPDES permit or waiver from the RWQCB. The RWQCB evaluates an NPDES permit application to determine whether the proposed discharge is consistent with the adopted water quality objectives of the basin plan.

Activities that are exempt from regulation under CWA Section 404(f), such as construction and maintenance in irrigation ditches, are also exempt from requirements to obtain coverage under Section 401 of the CWA. Therefore, if project activities receive a “no permit needed” designation from the USACE secondary to project review, no application for coverage under Section 401 will be filed. Notification of the “no permit required” designation should be provided to the RWQCB prior to the commencement of any ground disturbing activities.

5.2 State Regulations

5.2.1 California Endangered Species Act

The California Endangered Species Act enacted in 1984, is similar to the federal ESA, but pertains to state-listed endangered and threatened species. The CESA requires state agencies to consult with the CDFW when preparing documents to comply with the CEQA. The purpose is to ensure that the actions of the lead agency do not jeopardize the continued existence of a listed species or result in the destruction, or adverse modification of habitat essential to the continued existence of those species. In addition to formal listing under the federal and state endangered species acts, “species of special concern” receive consideration by CDFW. Species of special concern are those whose numbers, reproductive success, or habitat may be threatened.

5.2.2 California Fish and Game Code

5.2.2.1 CFGC Section 3503 and 3503.5

The California Fish and Game Code (CFGC) (§3503) states that “It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto.” “Take” includes the disturbance of an active nest resulting in the abandonment or loss of young.

Section §3503.5 of the CFGC states that it is “unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation pursuant thereto.”

5.2.2.2 CFGC Section 1600

The CDFW is a trustee agency that has jurisdiction under the CFGC (§1600 et seq.). The California Fish and Game Code (§1602), requires that a state or local government agency, public utility, or private entity must notify CDFW if a proposed project will “substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the department, or use any material from the streambeds... except when the department has been notified pursuant to §1601.” If an existing fish or wildlife resource may be substantially adversely affected by the activity, CDFW may propose reasonable measures that will allow protection of those resources. If these measures are agreeable to the parties involved, they may enter into an agreement with CDFW identifying the approved activities and associated mitigation measures.

5.2.2.3 CFGC Section 1900-1913

The California Native Plant Protection Act (CFGC §1900-1913) prohibits the taking, possessing, or sale within the state of any plants with a state designation of rare, threatened, or endangered as defined by CDFW. An exception to this prohibition allows landowners, under specific circumstances, to take listed plant species, provided that the owners first notify CDFW and give the agency at least 10 days to retrieve (and presumably replant) the plants before they are destroyed. Fish and Game Code §1913 exempts from the “take” prohibition “the removal of endangered or rare native plants from a canal, lateral ditch, building site, or road, or other right of way.” Very few of the plants constituting List 3 and List 4 meet the definitions of §1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and few, if any, are eligible for state listing. Therefore, List 3 and List 4 plant species are not required to be considered in the preparation of environmental documents relating to CEQA unless they are considered locally or regionally significant.

The CNPS maintains a list of plant species native to California with low population numbers, limited distribution, or otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Vascular Plants of California (CNPS 2001). Potential impacts to populations of CNPS-listed plants receive consideration under CEQA review. The CNPS listings categorize plants as follows:

- List 1A: Plants presumed extinct in California;
- List 1B: Plants rare, threatened, or endangered in California or elsewhere;
- List 2: Plants rare, threatened, or endangered in California, but more numerous elsewhere;
- List 3: Plants about which we need more information; and
- List 4: Plants of limited distribution.

5.2.3 *Public Resources Code*

5.2.3.1 *CEQA Guidelines Section 15380*

Although threatened and endangered species are protected by specific federal and state statutes, CEQA Guidelines §15380(d) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled based on the definition in the ESA and the section of the CFGC dealing with rare, threatened, and endangered plants and animals. The CEQA Guidelines (§15380) allows a public agency to undertake a review to determine if a significant effect on species that have not yet been listed by either the USFWS or CDFW (e.g. candidate species, species of concern) would occur. Thus, CEQA provides a lead agency with the ability to protect a species from a project's potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

5.2.3.1 *Oak Woodlands Section 21083.4*

As part of the determination made by a County as to whether a project is required to prepare an environmental impact report or negative declaration, "A county shall determine whether a project within its jurisdiction may result in a conversion of oak woodlands that will have a significant effect on the environment" (Public Resources Code (PRC) Section 21083.4(b)). If a county determines that there may be a significant effect to oak woodlands, the county shall require mitigation as identified in PRC Section 21083.4(b).

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Giant Garter Snake

Habitat within the project area meets the primary constituent elements for suitable habitat for GGS set forth in the 1997 *USACE Programmatic Formal Consultation for Permitted Projects with Relatively Small Effects on GGS within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter, and Yolo Counties, California* as well as the habitat components identified in the 2017 *USFWS Recovery Plan for the Giant Garter Snake*. The BSA contains adequate water during the snake's active season and thus, is hospitable habitat. Nearly year around the BSA has aquatic habitat that is required for foraging, cover, and transportation. The vegetation present in BSA is emergent and provides sufficient escape cover. The water and emergent vegetation also create suitable habitat for typical GGS prey (i.e. small fish, tadpoles, and frogs).

Due to the location of project improvements within suitable habitat for GGS and the potential for the species to be encountered on-site, the following avoidance and minimization measures shall be implemented so as to reduce the potential for impacts to the GGS and its habitat.

General Measures:

1. A Worker Awareness Training program will be developed prior to the initiation of construction activities. The training will educate all workers and site personnel about identification of GGS and appropriate actions to be taken in the event GGS are observed during construction. Under this training, information regarding the life history of GGS, the importance of irrigation canals, marshes/wetlands, and seasonally flooded areas, and a description of activities that qualify as take of the species including harassment, destruction of habitat, and death of an individual.
2. A GGS handling and relocation plan outlining appropriate procedures for these activities will be prepared for the project and provided to USFWS and CDFW (Agencies) for review and approval prior to commencement of construction. The generalized content is anticipated to include: conditions under which the biologist may order work stop and re-start; approved monitoring equipment and processing procedures, and procedures for treating an injured animal, including approved veterinary treatment facilities and their location.
3. A Spill Prevention Plan will be prepared to indicate the proper storage of any hazardous materials or petroleum products and fuels to be used in work activities and response measures, including appropriate response personnel and timing in the event of their accidental release.
4. In addition to the avoidance and minimization measures listed herein, compensatory mitigation will be purchased for the approximately 0.77 acres of temporary impact and 0.25 acres of permanent impact to suitable GGS habitat. The mitigation credits will be purchased from a CDFW and USFWS approved mitigation bank. The transaction will take place through a purchase and sale agreement, and funds must be transferred within 30 days, and prior to the initiation of any construction activities that would result in direct or indirect impacts to GGS.
5. Prior to initiation of ground disturbing work, the district will submit to the Agencies for approval the name and resume of an individual who will act as the Designated Biologist (DB). The DB shall be responsible for monitoring construction activities for compliance with measures so as to minimize and fully mitigate or avoid the incidental take of GGS and its associated habitat. Resumes for all biological staff who will be acting as biological monitors will also be submitted to the agencies for approval. A list of approved staff they may work as the acting DB will be maintained in the on-site construction monitoring binder.

Construction, Inspection and Monitoring Measures:

For project activities that require ground disturbance the following avoidance and minimization measures shall be applied to the project:

If project construction activities occur between May 1 through October 1

6. Construction workers and all on-site personnel (individuals who will be on-site longer than 30 minutes) will participate in the approved Worker Awareness Training program prior to the initiation of any on-site activities that could result in species impact. A record of trained personnel will be maintained on-site in the construction monitoring binder.
7. Best Management Practices (BMPs) will be implemented to minimize the potential for erosion and sedimentation into nearby waters.
8. Excavation and project work will be accomplished by equipment located and operated from the top of the canal. Areas already disturbed (i.e. canal roads) will be utilized prior to using undisturbed adjacent vegetated areas.
9. Stockpiling of construction materials, portable equipment, vehicles, and supplies will be restricted to the designated construction staging areas and all operations will be confined to the minimal area necessary. Stockpiles of suitable GGS burrow or cover material that have remained inactive

- for greater than 48 hours and are not within an excluded area shall be lifted, rather than pushed, so as to reduce the likelihood of injury to any individuals who may have inhabited the pile.
10. All project related vehicles will observe a 15-mile-per-hour speed limit within construction areas, except on existing paved roads where they will adhere to the posted speed limit.
 11. All construction related holes will be covered to prevent entrapment of individuals. Excavations that cannot be covered shall have an escape ramp placed within them and will be checked for entrapped wildlife.
 12. Construction personnel will look beneath parked vehicles and equipment and around/in heavy equipment tires prior to starting or moving equipment.
 13. Any excluded and dewatered habitat will remain dry for at least 48 hours and will be inspected by the DB prior to excavation or fill.
 14. Any dredged or excavated material shall be placed outside of designated GGS habitat.
 15. Typical Exclusion-to-Work-to-Restoration Program (for short duration projects < 1 week):
 - a. At least 3 weeks prior to scheduled ground disturbance, a series of work sites will be identified by the district for construction and submitted to DB to survey and photo document pre-construction conditions.
 - b. The DB will survey the list of work sites for the presence of burrows within excavation areas that may be utilized by GGS. If burrows are identified within the project area during the pre-construction survey, the DB will mark in-field areas requiring exclusion and submit a subsequent email to the district for exclusion implementation.
 - c. At least 1 week prior to ground disturbance, exclusionary fencing shall be placed around the potential habitat to exclude it from use by GGS. A one-way exit option (i.e. approved cone or equivalent) will be placed in each excluded area so as to allow individuals exit from the excluded area but no reentry. Areas that have been excluded will be checked once daily by the DB or trained district staff for entrapped wildlife.
 - d. No more than 24 hours prior to the commencement of ground disturbing activities, the project area shall be surveyed by the DB to document the presence or absence of GGS within the work area. This survey may occur directly before construction begins at a given site for the day.
 - e. During construction activities, existing vegetation will be preserved to the greatest extent feasible. Each small work site will be restored to as close to pre-construction conditions as possible. To accomplish this, the district will ensure that at the close of construction activities within a work area:
 - i. Canal contours have been restored to pre-construction conditions;
 - ii. Disturbed areas have had an approved native seed mix deployed;
 - iii. Areas with a large exposed area (posing a risk to water quality) will be protected from erosion through the use of erosion control mat (may not be fabricated with mono-filament netting), hydroseed, or other DB and agency approved method. Additional restoration work may include such activities as replanting species removed from banks (and preserved on-site) or replanting emergent vegetation in the active channel.
 - f. After all identified sites for a given work series have been completed, the DB will conduct post-construction inspections, photo documentation of the sites, and provide the district with any maintenance issues, should they be noted.
 16. If exclusion of an excavation area is not possible prior to ground disturbance; the DB will be on-site daily during ground disturbing activities within 200 feet of GGS aquatic habitat. Prior to construction activities each morning, visual surveys of the construction zone will be conducted to verify there are no GGS in the area. The DB will have the authority to stop construction activities if a GGS is encountered.

For project work activities that do not involve ground disturbance:

17. Twenty-four hours prior to the commencement of construction activities within the canal and upland areas within 200 feet of the canal, the project area shall be surveyed by the DB to document the presence or absence of GGS. The project will be re-inspected by the DB whenever a lapse of two weeks or greater has occurred. If any GGS are identified within the project area during the pre-construction survey, exclusionary fencing (i.e. snow fence) shall be placed around the habitat where the species was visualized to identify areas to be avoided during construction activity.

Additional Measures if project construction activities occur between October 1 through April 30:

In addition to the avoidance and minimization measures above, for work during the inactive season (October 1-April 30), the following measures will also be applied.

18. Approaching September 15, when GGS will be looking for suitable over-winter burrows, water levels throughout canals that will have over-winter work should be maintained at a level that covers (excludes) potential burrow habitat, to the extent feasible (as opposed to the normal drop in water levels). This water level should be maintained until approximately October 15, or until such time that sustained cool temperatures will have driven GGS into brumation.
19. Prior to September 15, areas where exclusion of habitat with high water flows will not be possible will be surveyed for rodent burrows in banks. If present, these burrows will be inspected by a qualified biologist or the DB, then collapsed with excavation equipment or by other mechanical means once GGS are determined absent. The DB will monitor the burrow “removal.”
 - Burrow removal work will occur between 11:00 a.m. and 6:00 p.m., when GGS are most likely to be above-ground. After burrows are removed, construction activities can proceed with no daily time constraints.
 - Where above-ground vegetative growth is removed after May 1 to facilitate rodent burrow removal, a 15-day lag will occur between the time of completion of vegetation removal and the start of rodent burrow removal activities. In the event of a late spring/early summer precipitation event that may force GGS underground for an extended period, burrow removal activities will cease until dry, warm weather returns. Resumption of burrow removal work will be coordinated with the DB.
20. If burrows are encountered during the GGS inactive season (i.e. openings that were hidden behind water control structures and not identified during pre-construction inspection), the biologist will direct for a temporary stop in construction work for burrow inspection. If a GGS(s) is present, the biologist will capture and relocate the snake according to the protocols in the relocation plan. During this process, an excavator may be used to assist the biologist with burrow excavation to allow inspection and snake capture. After burrows are inspected and snakes (if any) removed and relocated, the burrow(s) will be collapsed/buried and construction work will resume.

Species Encounter Measures:

21. If a snake (believed to be a giant garter snake) is encountered during construction, activities will cease until appropriate corrective measures have been completed or it has been determined that the snake will not be harmed. Giant garter snakes encountered during construction activities will be allowed to move away from construction activities on their own or may be moved by the DB, with CDFW and Service approval to handle the snake, to a designated relocation site, in accordance with the approved Relocation Plan.
22. Any GGS injured as a result of Project-related activities shall be taken immediately by the DB to a wildlife rehabilitation or veterinary care facility approved by USFWS and CDFW in advance of the start of Project Activities. The Permittee shall bear any costs associated with the veterinary treatment of injured GGS and shall notify USFWS and CDFW of the injury immediately, by

telephone and email and subsequently through the incident report. Notification shall include the name of the facility to which the injured GGS was taken.

Documentation and Reporting

23. The DB, and their trained and qualified representative biologists, will maintain a dedicated log of construction-monitoring activities. The log will contain the permits with attachments and signatures of all personnel who have successfully completed the education program (referenced below). All monitoring logs will contain daily written observation and inspections records summarizing: oversight activities and compliance inspections; survey results including observations of listed species and indications of their presence, and; monitoring activities required by the permit. The monitoring logs will be housed on-site during work activities, and offered to the resource agencies for inspection upon request. During periods of non-work, the log will be available at the district office.
24. The DB will provide USFWS and CDFW a written report that adequately documents the monitoring efforts within 24-hours of commencement of construction activities.
25. A quarterly report documenting all sites improved and overall project progress will be submitted to the USFWS and CDFW within one month of the close of a given quarter within one month following the close of the given quarter. The report will include the following:
 - a. A spreadsheet of all proposed work sites and their current status (completed, scheduled, pending, mid-work, etc.);
 - b. Pre- and post-construction photos for each improved site;
 - c. Updated compliance spreadsheet;
 - d. Calendar of working days.
26. Restoration of habitat shall be monitored for one year following implementation. A post-construction monitoring report documenting the restoration effort shall be submitted to the USFWS and CDFW one year after implementation of restoration. The report shall include:
 - a. Photo Documentation. Photo documentation will show post-project area conditions.
 - b. Dates that construction occurred and when restoration was completed.
 - c. What materials were used, plantings (if specified in approved Restoration Plan) and justification of any substitutions to recommended guidelines.
 - d. Pertinent information concerning the applicant's success in meeting project mitigation measures
 - e. An explanation of failure to meet such measures, if any, and recommendations for remedial actions and approval from USFWS and CDFW, if necessary.
 - f. Known project effects on federally listed species, if any.
 - g. Occurrences of incidental take of federally listed species, if any.
 - h. Other pertinent information.
27. The DB will submit all observations of listed species to the CNDDDB within 60 calendar days of the observation.

6.2 Northwestern Pond Turtle

Suitable aquatic habitat and upland nesting habitat is present within the BSA. If a northwestern pond turtle is observed in the project area during construction activities, project personnel will temporarily halt project activities until the turtle has moved itself to a safe location outside the limits of the project area, or the turtle will be relocated to suitable aquatic habitat within ¼ mile of the area. If project activities are to occur during the nesting season, (late June-July), a survey will be conducted by a qualified biologist to locate any northwestern pond turtles or their nests before project activities begin. This survey should be conducted no more than two days prior to the start of project activities. If a pond turtle nest is located, the biologist will flag the site and determine whether projects activities can avoid affecting the nest. If the nest cannot be avoided, a no-disturbance buffer zone will be established around the nest in coordination with CDFW. The no-disturbance buffer will remain in place until the young have left the nest.

6.3 Swainson's Hawk

Suitable nesting habitat is present within the BSA. Additionally, the species has been previously observed nesting in the BSA by representatives from CDFW. Project activities at individual locations will be minimal and generally restricted to the edges of the canals and the dirt roadway directly adjacent. These small areas in the context of the greater area do not provide the species with suitable foraging habitat as they will forage more readily in grassland, pasture, or fallowed agricultural fields before disturbed dirt roadway or canal banks.

If feasible, construction activities should be conducted outside of the bird breeding season. (March 1-August 31). If work must occur during bird breeding season, to ensure that no indirect impacts to active nest occur due to any future construction activities, a qualified biologist will conduct a pre-construction survey for Swainson's hawk and raptor nests. The area to be surveyed will include a 0.5-mile radius including and surrounding the BSA. If active nests are discovered, the District will be notified. No construction will occur until appropriate buffers are established, based upon recommendations by the qualified biologist. The pre-construction survey will be conducted no less than 14-days and no more than 30-days prior to commencement of construction. Should an active nest(s) be discovered, it will be monitored at reasonable intervals, as determined by a qualified biologist. The status of nesting activities shall be included in monthly reports to the District and/or regulatory agencies, as appropriate. Additionally, standard construction BMPs will be implemented which include returning disturbed areas to pre-construction condition which would include reseeding with an appropriate, approved seed mix.

6.4 Migratory Birds, and Nesting Raptors including Greater Sandhill Crane, Loggerhead Shrike, Merlin, Northern Harrier, Osprey, Song Sparrow and Tri-colored Blackbird

Vegetation removal or ground disturbance in areas where nests of birds protected by the MBTA (16 USC §703) and the CFGC (§3503) potentially occur, should be conducted between September 1 and February 28 (i.e. the non-breeding season). If vegetation removal or ground disturbance occurs during the breeding season (i.e. March 1 to August 31) then a qualified biologist shall:

- Conduct a survey for raptors and all other birds protected by the MBTA and map all nests located within 500 feet of construction areas. The survey should be conducted no more than two weeks prior to the start of project activities.
- Develop buffer zones around active nests that are sufficient enough in size to ensure impacts to nesting species are avoided. Project activities shall be prohibited within the buffer zone until young have fledged or the nest fails, as determined by a qualified biologist.

REFERENCES

- Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken, editors. 2012. *The Jepson Manual: Vascular Plants of California, Second Edition*. University of California Press, Berkeley.
- Bloom, P.H. and D. Van DeWater. 1994. Swainson's hawk. *In*: C.G. Thelander and M. Crabtree, editors. *Life on the Edge: A Guide to California's Endangered Natural Resources: Wildlife*. BioSystems Books, Santa Cruz, CA. pp. 150-151.
- CDFG. 1994. Staff Report regarding Mitigation for Impacts to Swainson's Hawks (*Buteo swainsoni*) in the Central Valley of California. Sacramento, CA.
- CDFG. 1983. Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities. California Department of Fish and Game. Sacramento, CA. Revised May 2000.
- CNDDDB. 2018. California Department of Fish and Wildlife. Biogeographic Data Branch. California Natural Diversity Database. RareFind v. 5.1.1
- CNPS. Rare Plant Program. 2018. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website. <http://www.rareplants.cnps.org>
- CNPS Rare Plant Scientific Advisory Committee. February 1991 (Revised April 1998). Mitigation Guidelines Regarding Impacts to Rare, Threatened, and Endangered Plants. California Native Plant Society. Sacramento, CA.
- California Office of Planning and Research and Office of Permit Assistance. 1986. CEQA: California Environmental Quality Act Statutes and Guidelines. Sacramento, CA. Revised 1999.
- California Wildlife Habitats Relationships System.
http://www.dfg.ca.gov/biogeodata/cwhr/wildlife_habitats.asp
- Estep, J. A. 1989. Biology, movements, and habitat relationships of the Swainson's Hawk in the Central Valley of California, 1986-87. Calif. Dept. Fish and Game, Nongame Bird and Mammal Sec. Rep., 52pp
- Fitzner, R.E. 1980. Behavioral ecology of the Swainson's hawk (*Buteo swainsoni*) in southeastern Washington. Pac. NW Lab PLN-2754.
- Hansen, G.E. 1988. Review of the Status of the Giant Garter Snake (*Thamnophis couchi gigas*) and its Supporting Habitat during 1986-1987. Final Report for California Department of Fish and Game, Contract C-2060.
- Hansen, R.W. and G.E. Hansen. 1990. *Thamnophis gigas* (giant garter snake) reproduction. Herpetological Review. 21(4): 93-94.
- Holland, R.F. 1986 Preliminary Descriptions of the Terrestrial Natural Communities of California. State of California, The Resources Agency, Nongame Heritage Program, Dept. of Fish and Game, Sacramento, CA

- Jennings, M. R. and M. P. Hayes. 1994. Amphibian and reptile species of special concern in California. California Department of Fish and Game. Rancho Cordova. 255 pp.
- Mayer, K.E. and W.F. Laudenslayer. 1988. A Guide to Wildlife Habitats of California. California Department of Forestry and Fire Protection. Sacramento, CA.
- NRCS. 2017. Soil Survey of Butte Area, California, Parts of Butte and Plumas Counties. Natural Resources Conservation Service.
- Sawyer, J.O., Keeler-Wolf, T. and J.M. Evans. 2008. A Manual of California Vegetation. Second Edition. California Native Plant Society. Sacramento, CA.
- Skinner, M. and B. Pavlik. 2001. Inventory of rare and endangered vascular plants of California, 5th edition. California Native Plant Society. Sacramento, CA.
- Snyder, N. F. R. and J. W. Wiley. 1976. Sexual Size Dimorphism in Hawks and Owls of North America. Ornithological Monograph No. 20.
- Stebbins, R.C. 1985. A field guide to western reptiles and amphibians. Second edition, revised. Houghton Mifflin Co. Boston, Massachusetts.
- USACE. 2016. *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports*.
- USACE. 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation manual. Arid West Region (Version 2.0)*.
- USACE. 2007. *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook*.
- USACE. 1987. *United States Army Corps of Engineers Wetlands Delineation Manual*.
- USFWS. 2018. Information for Planning and Consultation. Environmental Conservation Online System. Website <http://ecos.fws.gov/ipac>
- USFWS. 2017. Recovery Plan for the Giant Garter Snake (*Thamnophis gigas*). U.S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, California. vii + 71pp.
- USFWS. 2006. Giant Garter Snake (*Thamnophis gigas*) 5-Year Review: Summary and Evaluation. Sacramento, CA.
- USFWS. 1997. Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California.
- USFWS. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*.
- Woodbridge, B, K. K. Finley, and T. S. Seager. 1995. An investigation of the Swainson's hawk in Argentina. *J. Raptor Res.*29(3):202-204
- Tricolored Blackbird Portal. UC Davis (2018, April 20). Retrieved August 14, 2018, from <https://tricolor.ice.ucdavis.edu/about-tricolored-blackbirds>

Appendix A
APE Maps

Appendix B
USFWS Species List

IPaC Information for Planning and Consultation U.S. Fish & Wildlife Service

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Butte County, California



Local office

Sacramento Fish And Wildlife Office

☎ (916) 414-6600

📅 (916) 414-6713

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species

¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

-
1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information.
 2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS
Yellow-billed Cuckoo <i>Coccyzus americanus</i> There is proposed critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/3911	Threatened

Reptiles

NAME	STATUS
Giant Garter Snake <i>Thamnophis gigas</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog <i>Rana draytonii</i> There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander <i>Ambystoma californiense</i> There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt <i>Hypomesus transpacificus</i> There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Valley Elderberry Longhorn Beetle <i>Desmocerus californicus dimorphus</i> There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/7850	Threatened

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp <i>Branchinecta conservatio</i> There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/8246	Endangered
Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i> There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i> There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2246	Endangered

Flowering Plants

NAME	STATUS
Butte County Meadowfoam <i>Limnanthes floccosa</i> ssp. <i>californica</i> There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/4223	Endangered
Greene's Tuctoria <i>Tuctoria greenei</i> There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/1573	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act

¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Bald Eagle *Haliaeetus leucocephalus*

Breeds Jan 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

<https://ecos.fws.gov/ecp/species/1626>

<p>Burrowing Owl <i>Athene cunicularia</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9737</p>	Breeds Mar 15 to Aug 31
<p>Clark's Grebe <i>Aechmophorus clarkii</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds Jan 1 to Dec 31
<p>Golden Eagle <i>Aquila chrysaetos</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680</p>	Breeds Jan 1 to Aug 31
<p>Long-billed Curlew <i>Numenius americanus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5511</p>	Breeds elsewhere
<p>Marbled Godwit <i>Limosa fedoa</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481</p>	Breeds elsewhere
<p>Nuttall's Woodpecker <i>Picoides nuttallii</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9410</p>	Breeds Apr 1 to Jul 20
<p>Oak Titmouse <i>Baeolophus inornatus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9656</p>	Breeds Mar 15 to Jul 15
<p>Song Sparrow <i>Melospiza melodia</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA</p>	Breeds Feb 20 to Sep 5
<p>Spotted Towhee <i>Pipilo maculatus clementae</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/4243</p>	Breeds Apr 15 to Jul 20

Tricolored Blackbird *Agelaius tricolor*

Breeds Mar 15 to Aug 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/3910>

Whimbrel *Numenius phaeopus*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9483>

Willet *Tringa semipalmata*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Yellow-billed Magpie *Pica nuttalli*

Breeds Apr 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9726>

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.

- The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

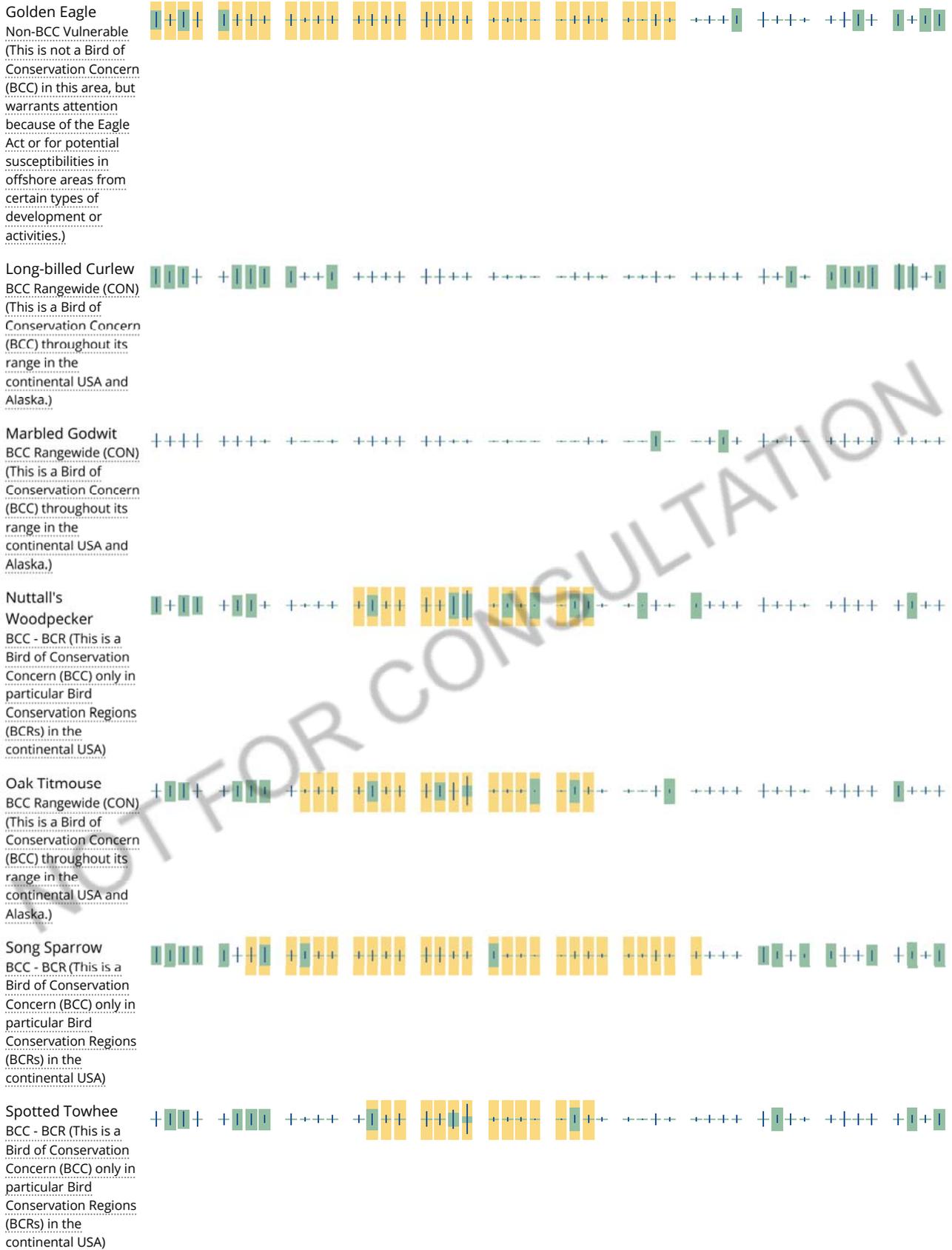
No Data (-)

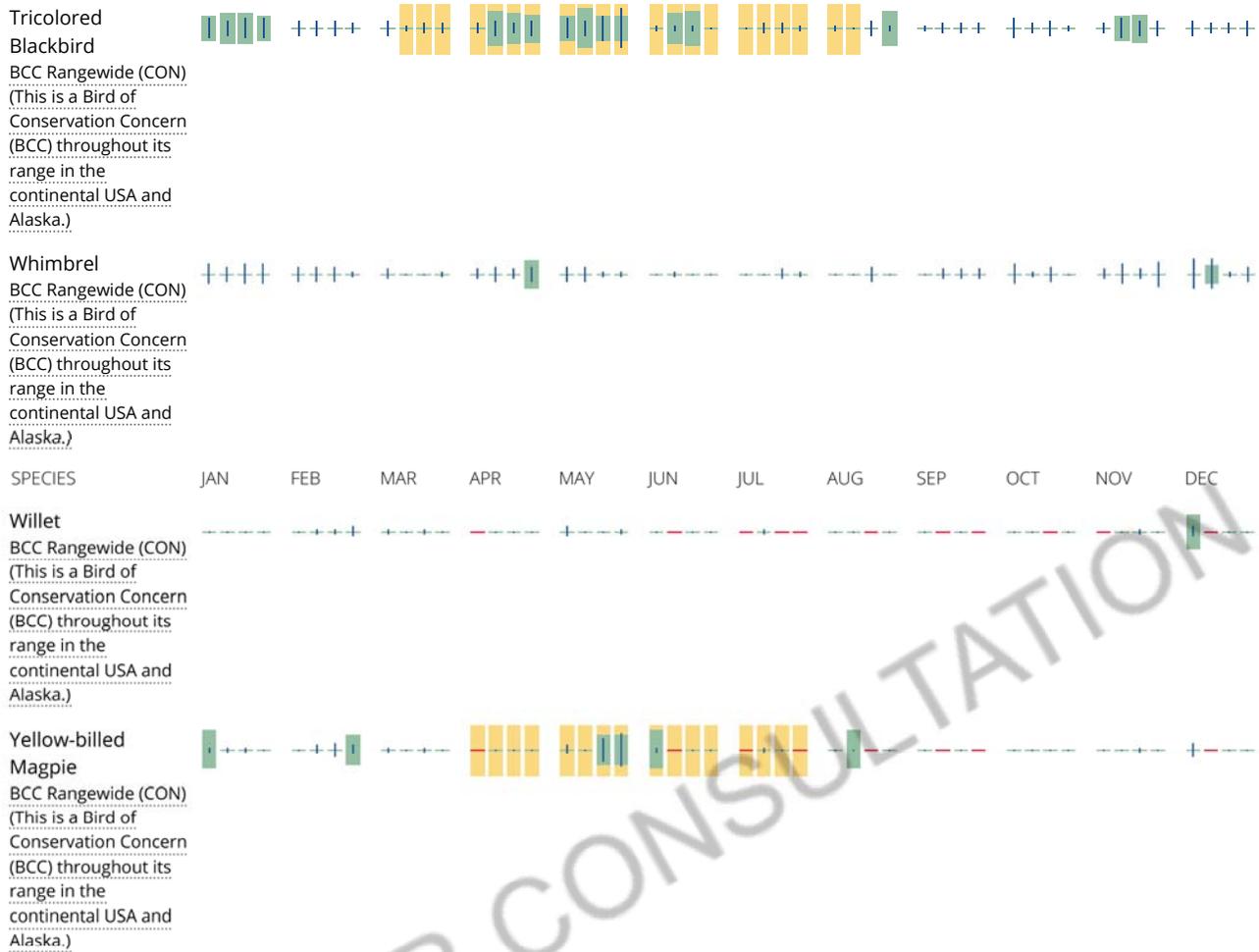
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.







Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) and/or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [E-bird Explore Data Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

Wildlife refuges and fish hatcheries

REFUGE AND FISH HATCHERY INFORMATION IS NOT AVAILABLE AT THIS TIME

Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

[PEM1K](#)

[PEM1A](#)

[PEM1Kx](#)

FRESHWATER FORESTED/SHRUB WETLAND

[PSS1A](#)

FRESHWATER POND

[PAB3Kx](#)

[PUBKx](#)

RIVERINE

[R2UBHx](#)[R2AB3Hx](#)[R5UBFx](#)[R4SBCx](#)[R2ABFx](#)[R5UBF](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Appendix C
CNDDDB Species List



Selected Elements by Common Name
 California Department of Fish and Wildlife
 California Natural Diversity Database



Query Criteria: Quad (West of Biggs (3912147) OR Llano Seco (3912158) OR Nelson (3912157) OR Shippee (3912156) OR Butte City (3912148) OR Biggs (3912146) OR Sanborn Slough (3912138) OR Pennington (3912137) OR Gridley (3912136))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
adobe-lily <i>Fritillaria pluriflora</i>	PMLIL0V0F0	None	None	G2G3	S2S3	1B.2
Ahart's dwarf rush <i>Juncus leiospermus var. ahartii</i>	PMJUN011L1	None	None	G2T1	S1	1B.2
Ahart's paronychia <i>Paronychia ahartii</i>	PDCAR0L0V0	None	None	G3	S3	1B.1
American badger <i>Taxidea taxus</i>	AMAJF04010	None	None	G5	S3	SSC
Baker's navarretia <i>Navarretia leucocephala ssp. bakeri</i>	PDPLM0C0E1	None	None	G4T2	S2	1B.1
bald eagle <i>Haliaeetus leucocephalus</i>	ABNKC10010	Delisted	Endangered	G5	S3	FP
bank swallow <i>Riparia riparia</i>	ABPAU08010	None	Threatened	G5	S2	
bent-flowered fiddleneck <i>Amsinckia lunaris</i>	PDBOR01070	None	None	G3	S3	1B.2
big-scale balsamroot <i>Balsamorhiza macrolepis</i>	PDAST11061	None	None	G2	S2	1B.2
Brazilian watermeal <i>Wolffia brasiliensis</i>	PMLEM03020	None	None	G5	S1	2B.3
burrowing owl <i>Athene cunicularia</i>	ABNSB10010	None	None	G4	S3	SSC
Butte County golden clover <i>Trifolium jokerstii</i>	PDFAB40310	None	None	G2	S2	1B.2
Butte County meadowfoam <i>Limnanthes floccosa ssp. californica</i>	PDLIM02042	Endangered	Endangered	G4T1	S1	1B.1
cackling (=Aleutian Canada) goose <i>Branta hutchinsii leucopareia</i>	ABNJB05035	Delisted	None	G5T3	S3	
California alkali grass <i>Puccinellia simplex</i>	PMPOA53110	None	None	G3	S2	1B.2
California black rail <i>Laterallus jamaicensis coturniculus</i>	ABNME03041	None	Threatened	G3G4T1	S1	FP
California linderiella <i>Linderiella occidentalis</i>	ICBRA06010	None	None	G2G3	S2S3	
California tiger salamander <i>Ambystoma californiense</i>	AAAAA01180	Threatened	Threatened	G2G3	S2S3	WL
chinook salmon - Central Valley spring-run ESU <i>Oncorhynchus tshawytscha pop. 6</i>	AFCHA0205A	Threatened	Threatened	G5	S1	



Selected Elements by Common Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Coastal and Valley Freshwater Marsh <i>Coastal and Valley Freshwater Marsh</i>	CTT52410CA	None	None	G3	S2.1	
Ferris' milk-vetch <i>Astragalus tener var. ferrisiae</i>	PDFAB0F8R3	None	None	G2T1	S1	1B.1
foothill yellow-legged frog <i>Rana boylei</i>	AAABH01050	None	Candidate Threatened	G3	S3	SSC
giant gartersnake <i>Thamnophis gigas</i>	ARADB36150	Threatened	Threatened	G2	S2	
great blue heron <i>Ardea herodias</i>	ABNGA04010	None	None	G5	S4	
great egret <i>Ardea alba</i>	ABNGA04040	None	None	G5	S4	
Great Valley Cottonwood Riparian Forest <i>Great Valley Cottonwood Riparian Forest</i>	CTT61410CA	None	None	G2	S2.1	
Great Valley Mixed Riparian Forest <i>Great Valley Mixed Riparian Forest</i>	CTT61420CA	None	None	G2	S2.2	
Great Valley Valley Oak Riparian Forest <i>Great Valley Valley Oak Riparian Forest</i>	CTT61430CA	None	None	G1	S1.1	
Great Valley Willow Scrub <i>Great Valley Willow Scrub</i>	CTT63410CA	None	None	G3	S3.2	
greater sandhill crane <i>Grus canadensis tabida</i>	ABNMK01014	None	Threatened	G5T4	S2	FP
Greene's tuctoria <i>Tuctoria greenei</i>	PMPOA6N010	Endangered	Rare	G1	S1	1B.1
heartscale <i>Atriplex cordulata var. cordulata</i>	PDCHE040B0	None	None	G3T2	S2	1B.2
hoary bat <i>Lasiurus cinereus</i>	AMACC05030	None	None	G5	S4	
least Bell's vireo <i>Vireo bellii pusillus</i>	ABPBW01114	Endangered	Endangered	G5T2	S2	
lesser saltscale <i>Atriplex minuscula</i>	PDCHE042M0	None	None	G2	S2	1B.1
loggerhead shrike <i>Lanius ludovicianus</i>	ABPBR01030	None	None	G4	S4	SSC
merlin <i>Falco columbarius</i>	ABNKD06030	None	None	G5	S3S4	WL
North American porcupine <i>Erethizon dorsatum</i>	AMAFJ01010	None	None	G5	S3	
Northern Basalt Flow Vernal Pool <i>Northern Basalt Flow Vernal Pool</i>	CTT44131CA	None	None	G3	S2.2	
Northern Hardpan Vernal Pool <i>Northern Hardpan Vernal Pool</i>	CTT44110CA	None	None	G3	S3.1	



Selected Elements by Common Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
northern harrier <i>Circus cyaneus</i>	ABNKC11010	None	None	G5	S3	SSC
Northern Volcanic Mud Flow Vernal Pool <i>Northern Volcanic Mud Flow Vernal Pool</i>	CTT44132CA	None	None	G1	S1.1	
osprey <i>Pandion haliaetus</i>	ABNKC01010	None	None	G5	S4	WL
pappose tarplant <i>Centromadia parryi ssp. parryi</i>	PDAST4R0P2	None	None	G3T2	S2	1B.2
Peruvian dodder <i>Cuscuta obtusiflora var. glandulosa</i>	PDCUS01111	None	None	G5T4T5	SH	2B.2
pink creamsacs <i>Castilleja rubicundula var. rubicundula</i>	PDSCR0D482	None	None	G5T2	S2	1B.2
recurved larkspur <i>Delphinium recurvatum</i>	PDRAN0B1J0	None	None	G2?	S2?	1B.2
Red Bluff dwarf rush <i>Juncus leiospermus var. leiospermus</i>	PMJUN011L2	None	None	G2T2	S2	1B.1
Sanford's arrowhead <i>Sagittaria sanfordii</i>	PMALI040Q0	None	None	G3	S3	1B.2
silver-haired bat <i>Lasionycteris noctivagans</i>	AMACC02010	None	None	G5	S3S4	
song sparrow ("Modesto" population) <i>Melospiza melodia</i>	ABPBXA3010	None	None	G5	S3?	SSC
steelhead - Central Valley DPS <i>Oncorhynchus mykiss irideus pop. 11</i>	AFCHA0209K	Threatened	None	G5T2Q	S2	
subtle orache <i>Atriplex subtilis</i>	PDCHE042T0	None	None	G1	S1	1B.2
Swainson's hawk <i>Buteo swainsoni</i>	ABNKC19070	None	Threatened	G5	S3	
tricolored blackbird <i>Agelaius tricolor</i>	ABPBXB0020	None	Candidate Endangered	G2G3	S1S2	SSC
valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	IICOL48011	Threatened	None	G3T2	S2	
vernal pool fairy shrimp <i>Branchinecta lynchi</i>	ICBRA03030	Threatened	None	G3	S3	
vernal pool tadpole shrimp <i>Lepidurus packardi</i>	ICBRA10010	Endangered	None	G4	S3S4	
water star-grass <i>Heteranthera dubia</i>	PMPON03010	None	None	G5	S2	2B.2
watershield <i>Brasenia schreberi</i>	PDCAB01010	None	None	G5	S3	2B.3
western pond turtle <i>Emys marmorata</i>	ARAAD02030	None	None	G3G4	S3	SSC



Selected Elements by Common Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
western red bat <i>Lasiurus blossevillii</i>	AMACC05060	None	None	G5	S3	SSC
western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>	ABNRB02022	Threatened	Endangered	G5T2T3	S1	
woolly rose-mallow <i>Hibiscus lasiocarpus var. occidentalis</i>	PDMAL0H0R3	None	None	G5T3	S3	1B.2
yellow warbler <i>Setophaga petechia</i>	ABPBX03010	None	None	G5	S3S4	SSC

Record Count: 65

Appendix D
CNPS Species List

Inventory of Rare and Endangered Plants

Plant List

34 matches found. [Click on scientific name for details](#)

Search Criteria

Found in Quads [3912158](#), [3912157](#), [3912156](#), [3912148](#), [3912147](#), [3912146](#), [3912138](#) [3912137](#) and [3912136](#);
[Modify Search Criteria](#) | [Export to Excel](#) | [Modify Columns](#) | [Modify Sort](#) | [Display Photos](#)

Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Rank	Global Rank
Amsinckia lunaris	bent-flowered fiddleneck	Boraginaceae	annual herb	Mar-Jun	1B.2	S2S3	G2G3
Astragalus pauperculus	depauperate milk-vetch	Fabaceae	annual herb	Mar-Jun	4.3	S4	G4
Astragalus tener var. ferrisiae	Ferris' milk-vetch	Fabaceae	annual herb	Apr-May	1B.1	S1	G2T1
Atriplex cordulata var. cordulata	heartscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G3T2
Atriplex minuscula	lesser saltscale	Chenopodiaceae	annual herb	May-Oct	1B.1	S2	G2
Atriplex subtilis	subtle orache	Chenopodiaceae	annual herb	Jun, Aug, Sep (Oct)	1B.2	S1	G1
Azolla microphylla	Mexican mosquito fern	Azollaceae	annual / perennial herb	Aug	4.2	S4	G5
Balsamorhiza macrolepis	big-scale balsamroot	Asteraceae	perennial herb	Mar-Jun	1B.2	S2	G2
Brasenia schreberi	watershield	Cabombaceae	perennial rhizomatous herb (aquatic)	Jun-Sep	2B.3	S3	G5
Bryum chryseum	brassy bryum	Bryaceae	moss		4.3	S3	G5
Castilleja rubicundula var. rubicundula	pink creamsacs	Orobanchaceae	annual herb (hemiparasitic)	Apr-Jun	1B.2	S2	G5T2
Centromadia	pappose	Asteraceae	annual herb	May-Nov	1B.2	S2	G3T2

<u>parryi ssp. parryi</u>	tarplant						
<u>Centromadia parryi ssp. rudis</u>	Parry's rough tarplant	Asteraceae	annual herb	May-Oct	4.2	S3	G3T3
<u>Cuscuta obtusiflora var. glandulosa</u>	Peruvian dodder	Convolvulaceae	annual vine (parasitic)	Jul-Oct	2B.2	SH	G5T4T5
<u>Delphinium recurvatum</u>	recurved larkspur	Ranunculaceae	perennial herb	Mar-Jun	1B.2	S2?	G2?
<u>Fritillaria pluriflora</u>	adobe-lily	Liliaceae	perennial bulbiferous herb	Feb-Apr	1B.2	S2S3	G2G3
<u>Hesperevax caulescens</u>	hogwallow starfish	Asteraceae	annual herb	Mar-Jun	4.2	S3	G3
<u>Heteranthera dubia</u>	water star-grass	Pontederiaceae	perennial herb (aquatic)	Jul-Oct	2B.2	S2	G5
<u>Hibiscus lasiocarpus var. occidentalis</u>	woolly rose-mallow	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	1B.2	S3	G5T3
<u>Juncus leiospermus var. ahartii</u>	Ahart's dwarf rush	Juncaceae	annual herb	Mar-May	1B.2	S1	G2T1
<u>Juncus leiospermus var. leiospermus</u>	Red Bluff dwarf rush	Juncaceae	annual herb	Mar-Jun	1B.1	S2	G2T2
<u>Limnanthes floccosa ssp. californica</u>	Butte County meadowfoam	Limnanthaceae	annual herb	Mar-May	1B.1	S1	G4T1
<u>Limnanthes floccosa ssp. floccosa</u>	woolly meadowfoam	Limnanthaceae	annual herb	Mar-May(Jun)	4.2	S3	G4T4
<u>Navarretia heterandra</u>	Tehama navarretia	Polemoniaceae	annual herb	Apr-Jun	4.3	S4	G4
<u>Navarretia leucocephala ssp. bakeri</u>	Baker's navarretia	Polemoniaceae	annual herb	Apr-Jul	1B.1	S2	G4T2
<u>Navarretia nigelliformis ssp. nigelliformis</u>	adobe navarretia	Polemoniaceae	annual herb	Apr-Jun	4.2	S3	G4T3
<u>Paronychia ahartii</u>	Ahart's paronychia	Caryophyllaceae	annual herb	Feb-Jun	1B.1	S3	G3
<u>Plagiobryoides vinosula</u>	wine-colored tufa moss	Bryaceae	moss		4.2	S2	G3G4

Polygonum bidwelliae	Bidwell's knotweed	Polygonaceae	annual herb	Apr-Jul	4.3	S4	G4
Puccinellia simplex	California alkali grass	Poaceae	annual herb	Mar-May	1B.2	S2	G3
Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	1B.2	S3	G3
Trifolium jokerstii	Butte County golden clover	Fabaceae	annual herb	Mar-May	1B.2	S2	G2
Tuctoria greenei	Greene's tuctoria	Poaceae	annual herb	May-Jul(Sep)	1B.1	S1	G1
Wolffia brasiliensis	Brazilian watermeal	Araceae	perennial herb (aquatic)	Apr,Dec	2B.3	S1	G5

Suggested Citation

California Native Plant Society, Rare Plant Program. 2018. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website <http://www.rareplants.cnps.org> [accessed 24 August 2018].

Search the Inventory

[Simple Search](#)

[Advanced Search](#)

[Glossary](#)

Information

[About the Inventory](#)

[About the Rare Plant Program](#)

[CNPS Home Page](#)

[About CNPS](#)

[Join CNPS](#)

Contributors

[The Calflora Database](#)

[The California Lichen Society](#)

[California Natural Diversity Database](#)

[The Jepson Flora Project](#)

[The Consortium of California Herbaria](#)

[CalPhotos](#)

Questions and Comments

rareplants@cnps.org

Appendix E

Species Observed in the BSA by NorthStar Biologists.

Plants	
Scientific Name	Common Name
<i>Anagallis arvensis</i>	Scarlet pimpernel
<i>Avena barbata</i>	Slender oat
<i>Avena fatua</i>	Wild oat
<i>Brassica nigra</i>	Black mustard
<i>Brassica rapa</i>	Field mustard
<i>Bromus diandrus</i>	Ripgut brome
<i>Bromus hordeaceus</i>	Soft brome
<i>Bromus madritensis</i>	Foxtail brome
<i>Carduus pycnocephalus</i>	Italian thistle
<i>Centaurea solstitialis</i>	Yellow star thistle
<i>Cichorium intybus</i>	Chicory
<i>Convolvulus arvensis</i>	Field bindweed
<i>Crypsis schoenoides</i>	Swamp grass
<i>Cynodon dactylon</i>	Bermuda grass
<i>Cyperus eragrostis</i>	Tall nutsedge
<i>Echinochloa crus-galli</i>	Watergrass
<i>Eleocharis macrostachya</i>	Pale spike rush
<i>Elymus caput-medusae</i>	Medusa head
<i>Erigeron canadensis</i>	Canada horseweed
<i>Gallium aparine</i>	Cleavers
<i>Geranium dissectum</i>	Cut-leaf geranium
<i>Grindelia caporum</i>	Common gumplant
<i>Helminthotheca echioides</i>	Bristly ox tongue
<i>Hordeum murinum ssp. leporinum</i>	Wall barley
<i>Lactuca serriola</i>	Prickly lettuce
<i>Lepidium latifolium</i>	Perennial pepperweed
<i>Lolium multiflorum</i>	Italian rye grass
<i>Lotus corniculatus</i>	Bird's foot treefoil
<i>Lugwia hexapetala</i>	Six petal water primrose
<i>Lugwia peploides</i>	Floating water primrose
<i>Malva parviflora</i>	Cheeseweed mallow
<i>Medicago polymorpha</i>	Bur clover
<i>Morus sp.</i>	Mulberry
<i>Oryza sativa</i>	Rice

<i>Paspalum dilatatum</i>	Dallisgrass
<i>Persicaria hydropiperoides</i>	Water pepper
<i>Persicaria maculosa</i>	Spotted ladysthumb
<i>Poa annua</i>	Annual bluegrass
<i>Populus fremontii</i>	Fremont's cottonwood
<i>Pseudognaphalium luteoalbum</i>	Jersey cudweed
<i>Raphanus raphanistrum</i>	Wild radish
<i>Rumex crispus</i>	Curly dock
<i>Salix exigua</i>	Sandbar willow
<i>Salix gooddingii</i>	Goodding's black willow
<i>Scirpus acutus</i> var. <i>occidentalis</i>	Tule
<i>Senecio vulgaris</i>	Common groundsel
<i>Sonchus asper</i>	Spiny sowthistle
<i>Sorghum halepense</i>	Johnsongrass
<i>Typha latifolia</i>	Broadleaf cattail
<i>Verbena litoralis</i>	Seashore vervain
<i>Vicia villosa</i>	Hairy vetch
<i>Xanthium strumarium</i>	Rough cocklebur
Wildlife	
Scientific Name	Common Name
Birds	
<i>Agelaius phoeniceus</i>	Red-winged blackbird
<i>Anas acuta</i>	Northern pintail
<i>Anas americana</i>	American wigeon
<i>Anas carolinensis</i>	Green-winged teal
<i>Anas cypeata</i>	Northern shoveler
<i>Anas platyrhynchos</i>	Mallard
<i>Aphelocoma californica</i>	California scrub-jay
<i>Anser albifrons</i>	Greater white-fronted goose
<i>Ardea alba</i>	Great egret
<i>Ardea herodias</i>	Great blue heron
<i>Buteo jamaicensis</i>	Red-tailed hawk
<i>Butorides virescens</i>	Green heron
<i>Calypte anna</i>	Anna's hummingbird
<i>Cathartes aura</i>	Turkey vulture
<i>Charadrius vociferus</i>	Killdeer
<i>Chondestes grammacus</i>	Lark sparrow
<i>Cistothorus palustris</i>	Marsh wren

<i>Colaptes auratus</i>	Northern flicker
<i>Corvus corax</i>	Common raven
<i>Cygnus columbianus</i>	Tundra swan
<i>Egretta thula</i>	Snowy egret
<i>Euphagus cyanocephalus</i>	Brewer's blackbird
<i>Fulica americana</i>	American coot
<i>Haliaeetus leucocephalus</i>	Bald eagle
<i>Haemorhous mexicanus</i>	House finch
<i>Hirundo rustica</i>	Barn swallow
<i>Icterus bullockii</i>	Bullock's oriole
<i>Melospiza lincolni</i>	Lincoln's sparrow
<i>Mimus polyglottos</i>	Northern mockingbird
<i>Molothrus ater</i>	Brown-headed cowbird
<i>Nycticorax nycticorax</i>	Black-crowned night heron
<i>Passer domesticus</i>	House sparrow
<i>Passerculus sandwichensis</i>	Savannah sparrow
<i>Phalacrocorax auritus</i>	Double-crested cormorant
<i>Pterochelidon pyrrhonota</i>	Cliff swallow
<i>Sayornis nigricans</i>	Black phoebe
<i>Spinus psaltria</i>	Lesser goldfinch
<i>Spinus tristis</i>	American goldfinch
<i>Stelgidopteryx serripennis</i>	Northern rough-winged swallow
<i>Streptopelia decaocto</i>	Eurasian collared-dove
<i>Sturnella neglecta</i>	Western meadowlark
<i>Sturnus vulgaris</i>	European starling
<i>Tachycineta bicolor</i>	Tree swallow
<i>Tyrannus verticalis</i>	Western kingbird
<i>Zenaida macroura</i>	Mourning dove
Reptiles and Amphibians	
<i>Lithobates catesbeianus</i>	American bullfrog
<i>Pseudacris sierra</i>	Sierran treefrog
<i>Sceloporus occidentalis</i>	Western fence lizard
<i>Thamnophis gigas</i>	Giant garter snake
<i>Thamnophis sirtalis fitchii</i>	Valley garter snake
Mammals	
<i>Lontra canadensis</i>	North American river otter
<i>Otospermophilus beecheyi</i>	California ground squirrel

Appendix B
Giant Garter Snake Habitat Assessment

**Richvale Irrigation District
On-Farm Delivery Measurement Program**

**Giant Garter Snake (*Thamnophis gigas*)
Habitat and Impact Assessment**



Prepared for:

NorthStar Engineering
111 Mission Ranch Blvd. Ste. 100
Chico, CA 95926

Prepared by:

Swaim Biological Inc.
4435 First Street, PMB 312
Livermore CA 94551

February 2019

SUMMARY

This report assesses the potential for a proposed project by the Richvale Irrigation District to upgrade its customer delivery measurement system, to impact the state- and federally-threatened giant garter snake (*Thamnophis gigas*; GGS) and its habitats within the project area. Habitats at the proposed improvement sites and the surrounding areas were characterized and their components were scored to determine their suitability for the species based on recognized ecological requirements. The habitat suitability scores were analyzed along with the anticipated impacts from the installation of the proposed delivery improvements to provide an overall impact analysis for the GGS. An estimate of the area of habitat to be temporarily and permanently impacted for each improvement site is included in this report.

The proposed actions include modifications at 12 locations along the Main Canal and Main West Canal, consisting primarily of retrofitting existing structures with new automated gates, and the construction of short, concrete-lined canal sections. Project activities at the sites where ground disturbing construction activities will take place in suitable GGS habitat are anticipated to require a combined total work area (including temporary and permanent impacts) of 0.22 acres. Construction is anticipated to result in temporary disturbance to a total of 0.146 acres of suitable GGS habitat (comprised of 0.097 acre of suitable GGS upland habitat and 0.05 acre of suitable GGS aquatic habitat). Permanent impacts from the construction of hardscape features within suitable GGS habitat are expected to result in the loss of 0.074 acre (comprised of 0.0 acre of suitable upland and 0.074 acre of suitable aquatic habitat). The remaining ground disturbing impacts will be in marginal GGS habitat and will total 0.018 (0.017 acres of temporary upland habitat and .001 acre of permanent upland habitat).

The main findings of this assessment are summarized as follows:

- Of the 12 sites where work will occur, 7 were determined to contain suitable GGS habitat and the remaining five were determined to contain marginal GGS habitat. None of the sites were determined to be unsuitable for GGS.
- Project activities that require ground disturbance will occur at 5 of the 12 sites. Three of these sites contain suitable GGS habitat.
- Total temporary project impacts were estimated to be 0.172 acres. Of this, 0.147 acre (0.097 in upland and 0.05 acre in aquatic habitat) is comprised of suitable GGS habitat.
- Total permanent project impacts to suitable GGS habitat were estimated to be 0.074 acres (aquatic habitat).
- Aquatic habitat impacts will occur only from construction of the concrete-lined canal sections, while impacts to upland habitat will occur at the other sites.
- Avoidance and minimization measures are recommended to reduce the potential for direct impacts to GGS and minimize impacts to their habitat.

TABLE OF CONTENTS

Project Overview	1
Description of Construction Activities	1
Giant Garter Snake Occurrences near the Project Area	2
Giant Garter Snake Habitat Assessment	4
Assessment Methods	4
Assessment Results	5
Habitat Impacts by Site Improvement Type.....	5
Summary and Conclusion	16
Recommended Avoidance and Minimization Measures	16
Literature Cited	17
Appendix A: Giant Garter Snake Species Description	18
Appendix B: Biological Resources Site Assessment Form	19
Appendix C: Representative Photographs	21
Appendix D: Comprehensive Table of Improvement Sites	24
Appendix E: CNDDDB Giant Garter Snake Regional Occurrence Records	26
Table 1: Activities Proposed at Project Locations	1
Table 2: Sites Requiring Ground Disturbance and GGS Habitat Suitability	6
Table 3 Estimated Total Area of Temporary and Permanent Impacts to Suitable GGS Habitat	8
Table 4: Temporary and Permanent Impacts to Suitable GGS Habitat	10
Figure 1: CNDDDB Records in the Project Vicinity	3
Figure 2: Overview of the Project Area and Detailed Maps of Work Locations	10

PROJECT OVERVIEW

The Richvale Irrigation District (District) On-Farm Delivery Measurement Program includes the structural modification of facilities at 12 sites located throughout the District’s water conveyance system in Butte County, California. The improvement project involves mostly minor construction activities, including upgrades of customer delivery measurements, and pumped deliveries from turnouts. The District has received implementation funding through the California Department of Water Resources and the U.S. Bureau of Reclamation, and the proposed actions are expected to be completed in 2019.

Description of Construction Activities

Project activities will vary according to the needs of each specific location (Table 1). These activities will include structural improvements at lateral canal headings along the Main Canal and Main West Canal to provide control of water level, flow, measurement and automation. Improvements will mostly consist of retrofitting of existing structures with new automated gates or the installation of weir boxes and Remote Tracker (RT) brackets. In addition, at some locations, improvements will include the construction of a concrete-lined section of the water canal which will include buried conduit. Ground disturbance resulting in temporary and permanent impacts during the removal and replacement of irrigation pipes, headwalls, and other water conveyance structures is expected to occur.

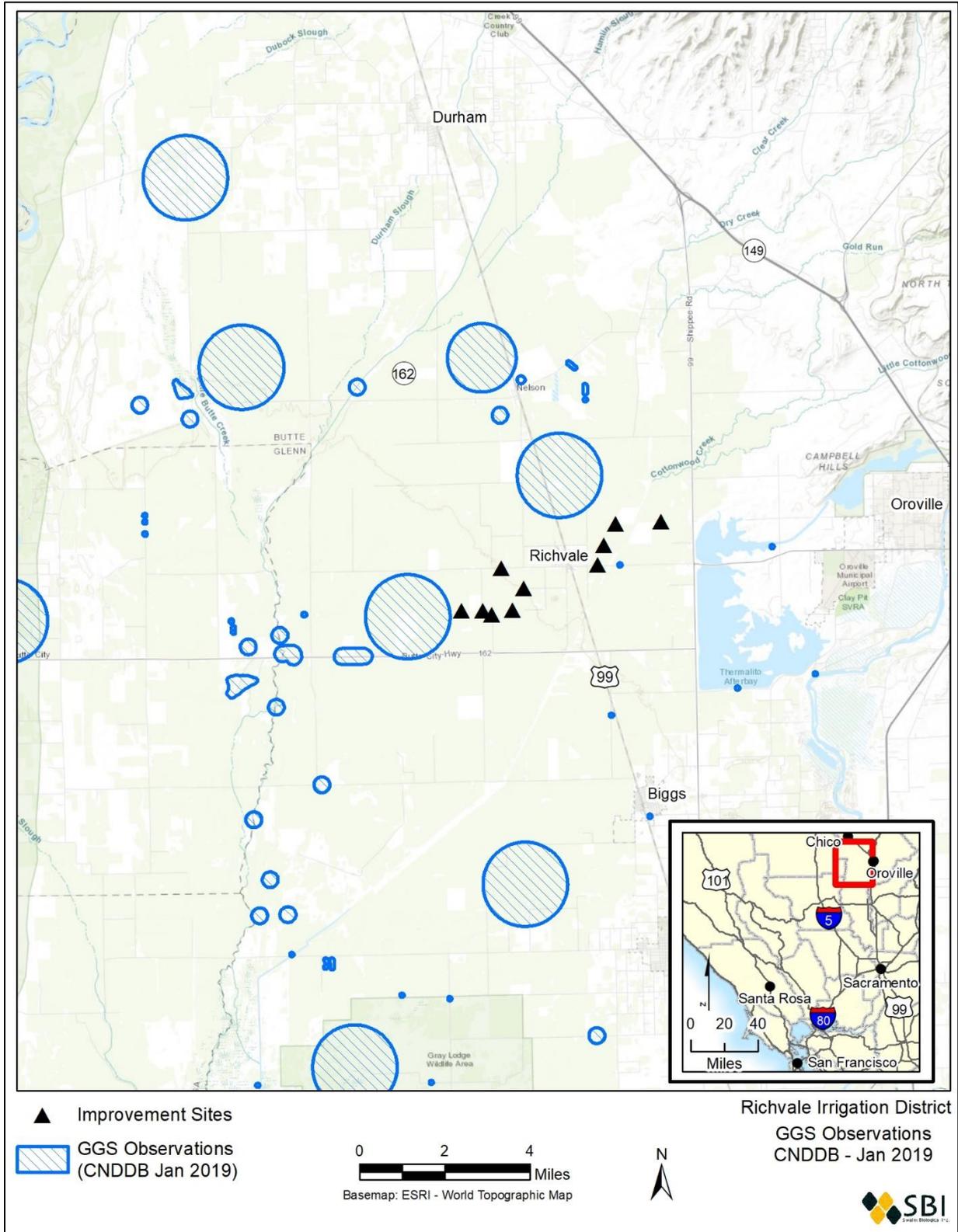
Table 1. Activities Proposed at Project Locations.

Site Name	Construction Activity	Ground Disturbance Required
Ollies Weir/Humpty West/Humpty Weir	Line section, bury conduit (105 ft), replace board bays with metal slide gates. Humpty West to be abandoned, boards removed.	Yes
Humpty South	Line section, bury conduit (270 ft)	Yes
Mixing Box	Line sections, actuated slide gate retrofit, replace 4 bays with slide gates and High Pump heading, bury conduit (470 ft)	Yes
Bradford Lateral	Weir box and RT bracket	Yes
Peterson Lateral	Weir box and RT bracket	Yes
Jones Weir	Actuated slide gate – retrofit	No
Banyon Flume Resolution/Watts Heading	Replace board bays with metal slide gates and ITRC flap gate	No
9010 Weir	Replace board bays with metal slide gates	No
Rystrom Weir	Replace board bays with metal slide gates	No
Low Pump Heading and Drop Structure	New actuated radial gates	No
Floyd’s Weir	Actuated slide gate – retrofit	No
Tower Weir	Actuated slide gate – retrofit	No

GGs OCCURENCES NEAR THE PROJECT AREA

The GGS occurs commonly in and around rice agriculture lands in Butte County. The California Natural Diversity Database (CNDDDB) contains three records of GGS within one mile of the overall project footprint. These include a record of a female captured in 1998 at the junction of Richvale East Road and Butler Canal, a record of an individual collected in 1942 about two miles north of Richvale, and three individuals captured about 3.7 miles west-southwest of Richdale in 2013. Approximately 14 additional GGS records occur within five miles of the project footprint, most of which are located to the north or west of the project. Each of these occurrences near the project area may be comprised of multiple GGS individuals. A map of improvement site locations and nearby GGS occurrences contained in the CNDDDB is shown in Figure 1, and a table of regional GGS CNDDDB occurrences are provided in Appendix E.

Figure 1. CNDDDB Records in the project vicinity. Richvale Irrigation District improvement sites (black triangles) and regional GGS occurrence distribution (blue hashed polygons).



GIANT GARTER SNAKE HABITAT ASSESSMENT

For this assessment, habitat evaluation criteria were identified based on recognized minimum ecological requirements for GGS (USFWS 2006). During the visual habitat assessment, the criteria at each site were assigned a numerical score and using the cumulative total, each site was classified as containing either unsuitable, marginal or suitable GGS habitat. The results of the assessment are shown in a series of maps illustrating habitat value by colored code for each improvement site based on habitat variables within and around the project area.

The area of habitat anticipated to be temporarily and permanently impacted for each improvement type is also reported in this assessment. Work area dimensions and area of temporary and permanent impacts for each improvement type were estimated using information provided by Davids Engineering.

Assessment Methods

On August 9, 2018, biologists conducted field surveys at the 12 work locations in order to characterize the habitat present and assess its potential to support the GGS. During the surveys, habitat was evaluated at each site, and characteristics were recorded on a worksheet using a list of 15 variables associated with GGS presence. The information was then entered in a database to calculate the cumulative habitat scores for each site. Scoring methodologies were adopted from the USFWS 1999 Draft Recovery Plan for the Giant Garter Snake (Appendix D: Page 157) and were modified based on the project components and field conditions. The modified habitat assessment score sheet and instructions for completing the form are included as appendices to this assessment (Appendix B). Representative photographs of project features and GGS are provided in Appendix C.

Assessed areas included aquatic and upland habitat features, including interconnected ditches, drains, channels or swales within 50 feet of identified features of the customer turnouts. Variables associated with the presence of prey or introduced fish were estimated by the relative size and hydrological connectivity of the aquatic habitat. Habitat classification break points were based upon recognized habitat characteristics of GGS and their life history, distribution, and habitat requirements. Habitat was assessed using the following guidelines:

Suitable Habitat

Work locations that scored between **20 – 28** on the habitat evaluation form were considered to contain suitable GGS habitat. Suitable habitat contains an abundance of the water needed for GGS foraging throughout the active season, the aquatic vegetation required for cover, and bankside refugia needed for foraging and terrestrial movement. During the active and dormant seasons, GGS prefer sunny banks with vegetation refugia or riprap that is used for basking and underground seasonal aestivation. Large, slow moving, and shallow aquatic habitats with gradually inclining banks are often preferable to deep, fast current channels that lack the herbaceous emergent vegetation typically found in GGS foraging habitat. In the Sacramento Valley, suitable GGS habitat requirements can be summarized as follows (USFWS 2006):

- 1) Adequate water during the snake's active season (early-spring through mid-fall) to provide food and cover;
- 2) Emergent herbaceous wetland vegetation for escape cover and foraging habitat during the active season;
- 3) Basking habitat of grassy banks and openings in waterside vegetation; and
- 4) Higher elevation uplands for cover and refuge from flood waters during the snake's dormant season in the winter.

Marginal Habitat

Work locations that received a habitat score of **17 – 19** were considered to be marginal GGS habitat. Marginal habitat contained only a minimal amount of the water, vegetation and refugia that is required for the snake. In portions of the project area containing marginal habitat, permanent water courses may have been present nearby but the surrounding area typically contained orchards or other land uses not suitable to sustain GGS populations. Water channels in riparian areas with high canopies or concrete-lined canals, bankside woody and densely vegetated banks that did provide sunny basking sites could be a deterrent to the GGS and were considered marginal habitat. Canal sections with steep banks with few or no shallow water areas that sustained herbaceous emergent vegetation typically found in GGS foraging habitat were considered marginal habitat. On its own, marginal habitat is considered incapable of supporting permanent populations of giant garter snakes and is typically ephemeral, providing no permanent source of prey. However, giant garter snakes may use areas of marginal habitat as connective corridors between areas of more suitable habitat.

Unsuitable Habitat

Work locations that scored between **0 – 16** were considered to be unsuitable habitat for GGS. Unsuitable habitat lacked summer aquatic and bankside basking areas with emergent vegetation for cover and thermal regulation. Uplands were usually absent, degraded, (e.g., row crop, orchard, overgrazed pasture, residential/developed, etc.), or lacked the refugia needed for extended periods of inactivity. Large rivers or fast-flowing canals with gravel or rock substrate composed of tall riparian, shaded banks would also be considered unsuitable habitat. Large rivers and floodplains that lacked higher elevation upland habitat with limited opportunities for cover and refuge from flood waters during the snake's inactive season also would be considered unsuitable.

Assessment Results

Habitat Impacts at Improvement Sites

The areas anticipated to be impacted by project activities at each improvement site were estimated by Davids Engineering based on the dimensions of weir boxes, check structures,

lateral canal headings and required work spaces at each site location. Improvement site impacts were classified depending on whether earthwork or other ground disturbance is required during construction (Table 5).

Above-Ground Only Improvements

At seven of the project work areas construction activities will be minor and will not result in ground disturbance. Minor improvements are limited to above-ground alterations to the canal structures and include the installation of radial, slide or flap gates to existing structures with the use of hand tools. Construction equipment such as backhoes, excavators, skip loaders or trenchers will not be needed at these sites, and temporary ground disturbance will not occur as a result of their use and movement (Table 1). Likewise, no new permanent hardscape features will be installed in previously vegetated or bare soil areas at these sites. It is anticipated that impacts to GGS and their habitats as a result of these activities are extremely unlikely to occur.

Sites Requiring Ground Disturbance

Improvements at the remaining five sites will require some degree of ground disturbance and therefore may impact GGS habitat where it is present. Sites requiring the replacement of turnouts including new weir box or construction of concrete-lined section of canal will have the greatest extent of impacts from excavations, and will require the movement of equipment, including backhoes or skiploaders, excavators and flatbed trucks which may result in additional ground disturbance.

Table 2. Sites Requiring Ground Disturbance and GGS Habitat Suitability.

Habitat Impact	<u>Habitat Suitability Score</u>			
	Unsuitable	Marginal	Suitable	Total
No Ground Disturbance	0	3	4	7
Ground Disturbance	0	2	3	5
Total	0	5	7	12

Temporary vs. Permanent Impacts

Permanent impacts were defined as the conversion of natural land cover to developed land cover through the installation of concrete or metal structures, paved roads, or similar features anticipated to last two or more years. Temporary impacts were defined as the conversion of natural land cover to disturbed land cover through excavation or other substantial alteration of vegetation and soil surface lasting no more than one year.

Most project-related impacts will be temporary and will occur as the result of disturbance during the replacement of existing features, or of ground disturbance from the movement of heavy construction equipment. In instances where canal banks or beds are built with hardscape material (e.g., gravel or concrete), impacts were considered permanent.

Extent of Project Impacts

The area of ground disturbance anticipated to be required at each site is provided in Table 3. Permanent impact areas were estimated as 20 ft² for each weir box replacement at Peterson and Bradford Lateral. At the sites where sections of canal will be lined with concrete (Humpy South, Humpy West and two sites located at Mixing Box), permanent impact areas were estimated by multiplying the lengths of sections to be replaced (30 ft.) by their maximum top widths (which varied from 17 ft. to 32 ft.). For sites where the installation of concrete lining will occur, temporary impacts resulting from excavations and the movement of equipment were estimated by including a 10 ft. work area buffer on all sides of the canal section to be modified. Temporary impacts at sites where gate installations will occur were estimated by the dimensions of the underground conduit cable needed for installation of actuated slide gates.

Impacts to Suitable Habitat

Seven of the 12 improvement sites evaluated were determined to contain suitable GGS habitat. Of the sites located in suitable habitat for GGS, three have planned improvements which include the construction of concrete-lined sections that will result in permanent impacts. Project activities in those areas are anticipated to result in temporary impacts to 0.146 acres of suitable GGS upland and aquatic habitat and permanent impacts to approximately 0.074 acres of suitable aquatic GGS habitat (Table 4).

Most of the project area contained suitable GGS habitat and included a combination of water canals, ditches, drains, flooded rice fields and upland banks that comprises the water conveyance infrastructure. These habitat areas contained features necessary to support permanent GGS populations through the proximity with flooded rice fields and associated irrigation canals, which allowed for sufficient water during the active summer season to supply cover and prey items such as small fish and amphibians. The presence of adjacent perennial wetlands and/or ponds near some of these sites further enhanced their habitat value. Improvement sites within suitable GGS habitat were found throughout the project area including, but not limited to, Ollie's Weir, Humpy West, Humpy South, Mixing Box and Humpy Weir. Based on their habitat characteristics and the known presence of GGS in the project vicinity, all of the habitat

improvement sites containing suitable habitat have a strong likelihood of being occupied by GGS on a relatively permanent basis.

Table 3. Estimated Total Area of Temporary and Permanent Impacts to Suitable GGS Habitat.

Site Name	Activity	Ground Disturbance Required	Work Area Footprint	GGH Habitat Classification
Ollies Weir/Humpty West/Humpty Weir	Line section, bury conduit (105ft), replace board bays with metal slide gates. Humpty West to be abandoned, boards removed.	Yes	2,920	Suitable
Humpty South	Line section, bury conduit (270 ft)	Yes	2,940	Suitable
Mixing Box	Line sections, actuated slide gate retrofit, replace 4 bays with slide gates and High Pump heading, bury conduit (470 ft)	Yes	5,490	Suitable
Bradford Lateral	Weir box and RT bracket	Yes	288	Marginal
Peterson Lateral	Weir box and RT bracket	Yes	144	Marginal
Jones Weir	Actuated slide gate – retrofit	No	100	Suitable
Banyon Flume Resolution/Watts Heading	Replace board bays with metal slide gates and ITRC flap gate	No	100	Suitable
9010 Weir	Replace board bays with metal slide gates	No	100	Suitable
Rystrom Weir	Replace board bays with metal slide gates	No	100	Suitable
Low Pump Heading and Drop Structure	New actuated radial gates	No	100	Marginal
Floyd’s Weir	Actuated slide gate – retrofit	No	100	Marginal
Tower Weir	Actuated slide gate – retrofit	No	100	Marginal
Total within suitable habitat (sq ft)			11,750	
Total within suitable habitat (acres)			0.27	

Table 4. Temporary and Permanent Impacts to Suitable GGS Habitat.

Improvement Site	Temporary Upland Impacts	Temporary Aquatic Impacts	Permanent Upland Impacts	Permanent Aquatic Impacts
Ollies Weir/Humpty West/Humpty Weir	1,370	620	0	930
Humpty South	1,540	560	0	840
Mixing Box	1,310	980	0	1,470
TOTAL (sq. ft.)	4,220	2,160	0	3,240
TOTAL (acres)	0.097	0.050	0.000	0.074
	0.147		0.074	

Table 5. Temporary and Permanent Impacts to all RID improvement locations.

Improvement Site	Temporary Upland Impacts	Temporary Aquatic Impacts	Permanent Upland Impacts	Permanent Aquatic Impacts
Ollies Weir/Humpty West/Humpty Weir	1,370	620	0	930
Humpty South	1,540	560	0	840
Mixing Box	1,310	980	0	1,470
Tower Weir	100	0	0	0
Floyds Weir	100	0	0	0
Drop Structure	100	0	0	0
Peterson Lateral	144	0	20	0
Bradford Lateral	288	0	40	0
Jones Weir	100	0	0	0
9010 Weir	100	0	0	0
Rystrom Weir	100	0	0	0
Banyon Flume	100	0	0	0
TOTAL (sq. ft.)	5,352	2,160	60	3240
TOTAL (acres)	0.123	0.050	0.001	0.074
	0.172		0.076	

Impacts to Marginal Habitat

Five of the work locations were determined to contain marginal GGS habitat. Of these sites, two have planned improvements that will require ground disturbance. Project activities in those areas are anticipated to result in temporary impacts to 0.017 acres of marginal GGS upland habitat and permanent impacts to approximately 60 ft² (.001 acre) of marginal GGS upland habitat.

Within the project area, sites that were classified as marginal contained only a minimal amount of the water, vegetation, and refugia required to sustain GGS. In the marginal habitat sites, work areas may have been near permanent water courses and rice fields but were also near orchards or other land uses not suitable for GGS populations. Improvement sites with marginal habitat may have had adequate water present but lacked either emergent, herbaceous aquatic vegetation or vegetated banks that provide basking and refugia. At some of the improvement sites with marginal habitat, water channels contained more riparian habitat with high canopies or concrete-lined canals, or bankside woody or densely vegetated banks that do not provide sunny basking sites. Marginal habitat usually had minimal bankside burrows and crevices that provide short-term aestivation sites, and unsuitable sites were typically missing seasonal GGS aquatic habitat and contained only degraded upland habitat, e.g., adjacent to orchards and other incompatible land types.

Marginal GGS habitat within the project area was generally found closer to developments associated with the community of Richvale, and the upland habitat tended to include residential or orchard land cover. These areas included Bradford Lateral and Peterson Lateral.

Improvement sites determined to contain marginal habitat may have had adequate water present but lacked either emergent, herbaceous aquatic vegetation or vegetated banks that provide basking and refugia. Based on their habitat characteristics and the known presence of GGS in the project vicinity, the habitat improvement sites containing marginal habitat, if used by GGS, are likely to be occupied only on a temporary basis.

Impacts to Unsuitable Habitat

None of the work locations for this assessment are located in unsuitable habitat.

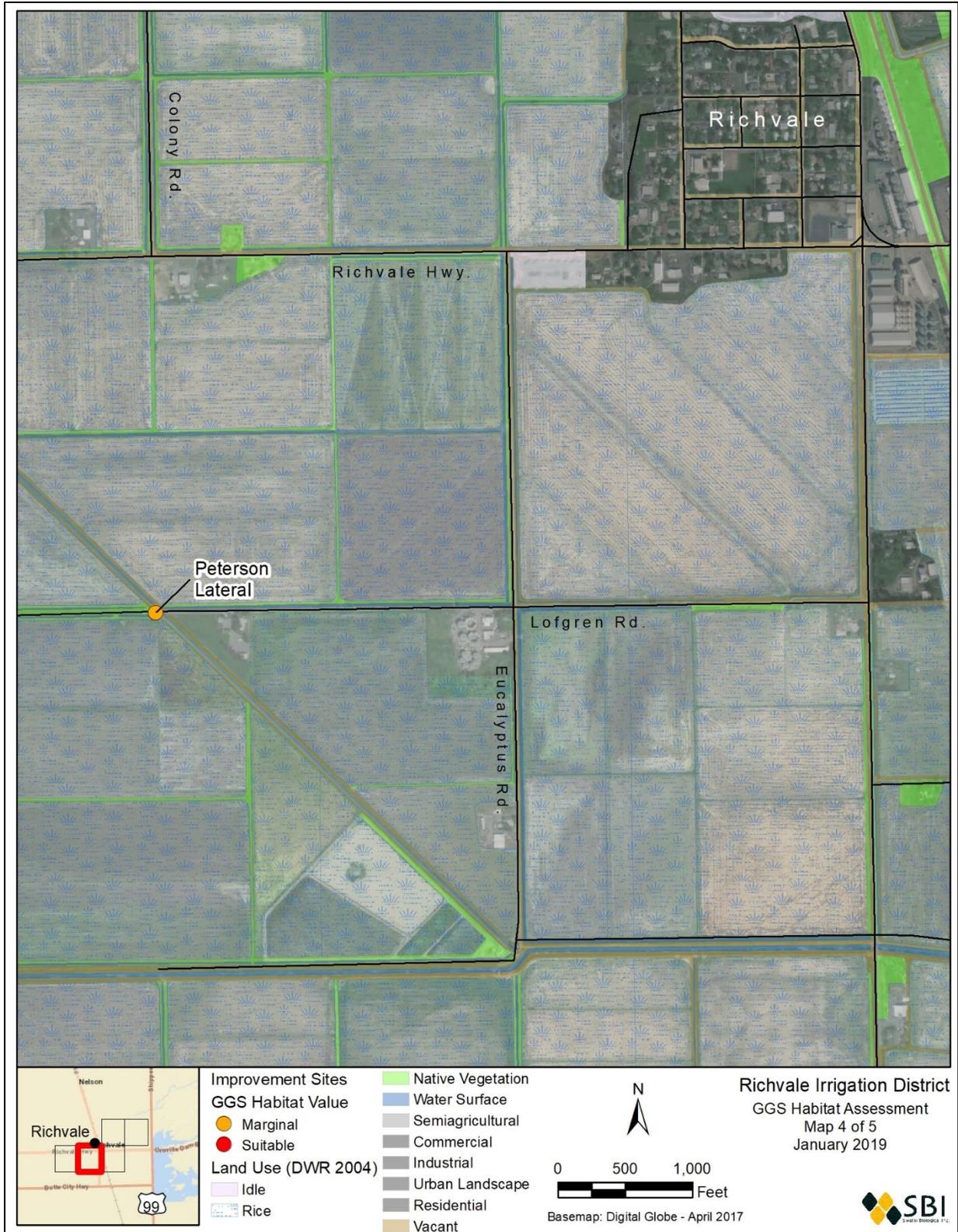
Figure 2. Overview of the Project Area and Detailed Maps of Work Locations.













SUMMARY AND CONCLUSION

This assessment classified habitat within and adjacent to project work locations for its suitability to support giant gartersnake and identified impacts associated with project activities in order to evaluate the overall project impacts to the species. Several of the work locations assessed contained suitable GGS habitat, and for sites containing suitable habitat where ground disturbance will occur, there is a substantial risk that project activities will result in direct or indirect effects to GGS. In all, seven sites were determined to contain suitable GGS habitat, but only three of these are located in areas where ground disturbance is anticipated to occur. Activities at these sites will result in 0.77 acres of temporary impacts (0.20 and 0.57 acre in upland and aquatic habitat, respectively), and 0.12 acres of permanent impacts (0.05 and 0.07 acre in upland and aquatic habitat, respectively).

At work locations where activities are planned to occur in suitable GGS habitat but where no ground disturbance is required, it is likely that effects to GGS can be avoided during project activities by implementing conservation measures to avoid and minimize impacts (described below). Likewise, in areas containing marginal GGS habitat the incorporation of conservation measures into the project are anticipated to reduce the risk of impacts to GGS to a low level.

RECOMMENDED AVOIDANCE AND MINIMIZATION MEASURES

Due to the location of the project within suitable habitat for GGS and the potential for the species to be encountered onsite, measures to minimize the potential for impacts to the GGS and its habitats should be incorporated into the project. It is recommended that the following measures be implemented during project activities:

1. Confine movement of heavy equipment to existing roadways to minimize habitat disturbance.
2. Construction activity within habitat should be conducted between May 1 and October 1. This is the active period for giant garter snakes and direct mortality is lessened, because snakes are expected to actively move and avoid danger.
3. Confine clearing to the minimal area necessary to facilitate construction activities. Flag and designate giant garter snake habitat within or adjacent to the project area as Environmentally Sensitive Areas. These areas should be avoided by all construction personnel.
4. Construction personnel should receive worker environmental awareness training, instructing workers to recognize giant garter snakes and their habitat(s).
5. No more than 24-hours prior to construction activities, each work area should be surveyed for giant garter snakes. Surveys of active work areas should be repeated if a lapse in construction activity of two weeks or greater has occurred. If a snake is encountered during construction, activities should cease until appropriate corrective

measures have been completed or it has been determined that the snake will not be harmed.

6. Any dewatered habitat should remain dry for at least 15 consecutive days between April 15 and October 1, and prior to excavating or filling of the dewatered habitat.
7. After completion of construction activities, remove any temporary fill and construction debris and, wherever feasible, restore disturbed areas to pre-project conditions. Restoration work may include such activities as replanting species removed from banks or replanting emergent vegetation in the active channel.

LITERATURE CITED

U.S. Fish and Wildlife Service (USFWS). 1999. Draft recovery plan for the giant garter snake (*Thamnophis gigas*). U.S. Fish and Wildlife Service, Portland, Oregon: 192 pp.

_____. 2006. Giant garter snake (*Thamnophis gigas*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, Sacramento, CA. 46 pp.

Wylie, G.D. and M.L. Casazza. 2000. Investigations of the giant garter snakes in the Natomas Basin: 1998-1999. Unpublished report. U.S. Geological Survey, Biological Resources Division, Dixon Field Station, Dixon, California. March 2000. 20 pp.

APPENDIX A. Giant Garter Snake Species Description

The state- and federally-threatened giant garter snake (GGS) is a highly aquatic species and is endemic to wetlands of the Central Valley. It requires low-gradient aquatic habitats with a hydro-period extending sufficiently long into the summer to support prey species such as fish and amphibians. It also requires adjacent upland areas with underground refuges and hibernacula above the level of winter flooding. Historically, the GGS was found to inhabit freshwater tule marshes, streams and wetlands throughout the length of the Sacramento and San Joaquin Valleys in central California. Currently, GGS can be found in modified habitats including agricultural canals and ditches, often associated with rice farming and flooding. Perennial wetlands provide the highest quality habitat for the GGS, and rice lands, with interconnected water conveyance structures, serve as an alternative habitat in the absence of higher quality wetlands. These canals need to have sufficient basking sites as well as vegetation to provide cover and support their secretive behavior. The GGS is active from early spring (April –May) through mid-fall (October-November), although this period of activity varies based on weather. During the winter season they are much less active and rarely emerge from burrows. When active they usually remain near wetland habitat, although they can move up to 0.8 km in a day (USFWS 1999).

The loss and fragmentation of habitat is the leading threat to GGS throughout the range of the species. Habitat loss has occurred from urban expansion, agricultural conversion, and flood control. Fragmentation limits dispersal and isolates populations of the giant garter snake, increasing the likelihood of inbreeding, decreasing fitness, and reducing genetic diversity. Some populations of the giant garter snake are subject to the cumulative effects of a number of other existing and potential threats, including roads and vehicular traffic, predation by non-native species and climate change.

Irrigated cropland adjoining rice or managed wetlands may be included as suitable habitat because canals associated with irrigated cropland in close proximity are often used by the species. Due to lack of habitat and emergent vegetative cover, giant garter snakes generally are not present in larger rivers with sand, rock, and gravel substrates (e.g., the Sacramento River, Feather River). Riparian woodlands are unlikely to provide suitable habitat due to excessive shade, lack of basking sites, and absence of prey populations (USFWS 2006).

APPENDIX B. Biological Resources Site Assessment Form

BWGWGD SITE IMPROVEMENTS PROJECT - BIOLOGICAL RESOURCES SITE ASSESSMENT FORM

OWNER:		COUNTY:	BUTTE	DATE:		TURNOUT	
PROJECT #	18-030	STATE:	CA	TIME:		ID	
INVESTIGATORS:							

Route:		Latitude:		Improve Type:		Pipe Diameter:	
Canal:		Longitude:		Pipe Type:		Pipe Length (ft):	

OVERALL SITE EVALUATION FOR GGS HABITAT:

Unsuitable
 Marginal
 Suitable

ADJACENT LAND USE: (developed=hardscape/paved; marginal=orchard, pasture, landscaped/unpaved; suitable=rice paddy)

Developed _____%
 Marginal _____%
 Suitable _____%

IMPROVEMENT TYPE:

1	Weir Box on Downstream End of Pipe Only	7	Magnetic Flow Meter (pipe modifications necessary)
2	Full Replacement of Turnout (includes new headwall, gate, pipe, and box)	8	Two Magnetic Flow Meters (no pipe modifications necessary)
3	Replace Canal Gate and Install Weir Box on Downstream End of Pipe	9	Two Magnetic Flow Meters (pipe modifications necessary)
4	Remote Tracker Mounting Bracket and Weir Boards	10	Turnouts within Gray Lodge Project improvement area
5	Weir Vault In-line with Existing On-Farm Pipeline	11	No Improvements Required (previously improved or comply as-is)
6	Magnetic Flow Meter (no pipe modifications necessary)		

CANAL DETAIL:

Canal Width (bankfull) _____ ft.
 Characteristics of the floodplain unit: _____
 Total veg cover: _____ %
 OHWM Width _____ ft.
 Herb _____ %
 Shrub _____ %
 Tree: _____ %

SPECIES OBSERVED:

NOTES:

SITE SPECIFIC GIANT GARTER SNAKE HABITAT COMPONENT ASSESSMENT SHEET

AQUATIC COMPONENTS: *Fresh-water habitat components with protective emergent vegetative cover that will allow foraging.*

- 1. Water present March - November (0 = no water present; 1 = intermittent presence; 2 = water present continuously) ___/2
- 2. Slow moving or static water flow with mud substrate (+0 for rapid flow; +1 for slow/static flow; +0 non-mud substrate +1 mud substrate) ___/2
- 3. Presence of emergent and bankside veg that provides cover from predators and may serve in thermoregulation (0 = no veg; 1 = partial veg cover; 2 = full veg cover) ___/2
- 4. The absence of a continuous canopy of riparian vegetation (0 = continuous canopy; 1 = partial canopy; 2 = no canopy) ___/2
- 5. Available prey in the form of small amphibians and small fish (0 = no prey; 1 = marginal prey habitat; 2 = rich prey habitat) ___/2
- 6. Thermoregulation (basking) sites w/supportive veg (i.e. folded tule clumps immediately adjacent to escape cover) (0 = no basking sites; 1 = marginal/few basking sites; 2 = sufficient basking sites present) ___/2
- 7. Large predatory fish (0 = predatory fish present; 1 = fish present part of year; 2 = fish absent) ___/2
- 8. Recurrent flooding (0 = no upland refugia; 1 = marginal, where flooding is probable the presence of upland refugia; 2 = if flooding, suitable upland refugia present) ___/2

TOTAL AQUATIC COMPONENT SCORE _____

NOTES:

UPLAND COMPONENTS: *Upland habitat components near the aquatic habitat that can be used for the thermoregulation and for summer shelter in burrows.*

- 1. Availability of bankside vegetative cover, typically tule (*Scirpus* sp.) or cattail (*Typus* sp.), for screening from predators (0 = no availability; 1 = marginal availability; 2 = available) ___/2
- 2. Availability of more permanent shelter, such as bankside cracks or crevices, holes, or small mammal burrows (0 = no availability; 1 = marginal availability; 2 = available) ___/2
- 3. Grazing management practices (0 = overgrazed, to the point at which GGS refugia has been reduced or eliminated; 1 = moderate grazing; 2 = limited grazing/natural) ___/2
- 4. Adjacent land use within upland habitat near aquatic habitat (0 = unsuitable - developed, hardscape/paved; 1 = marginal - orchard, pasture, landscaped/unpaved; 2 = suitable - rice paddy) ___/2

TOTAL UPLAND COMPONENT SCORE _____

NOTES:

UPLAND REFUGIA COMPONENTS: *An upland refugia component that will serve as winter hibernacula*

- 1. Presence of over-winter locations such as mammal burrows along canal banks and marsh locations, or riprap near marsh or road (0 = none, few burrows; 1 = some burrows; 2 = many) ___/2
- 2. Area where burrows potential refugia occurs does not experience channel flooding or rapidly moving water during the over-winter months (approx October 1 - April 30) (0 = flooding; 1 = no flooding) ___/1
- 3. Potential burrows are located within 500 feet from edge of summer aquatic habitat (0 = no potential; 1 = potential) ___/1

TOTAL UPLAND REFUGIA COMPONENT SCORE _____

NOTES:

TOTAL AQUATIC COMPONENT SCORE	
TOTAL UPLAND COMPONENT SCORE	
TOTAL UPLAND REFUGIA COMPONENT SCORE	
GGG HABITAT SCORE	/28

APPENDIX C. Representative Photographs

Photo 1. Banyon Flume/Watts Heading. Located in suitable habitat



Photo 2. Rystrom Weir. Located in suitable habitat.



Photo 3. Ollie's Weir. Located in suitable habitat.



Photo 4. Humpy West, lined section. Located in suitable habitat.



Photo 5. Humpy Weir. Located in suitable habitat.



Photo 6. 9010 Weir. Located in suitable habitat.



Photo 7. Tower Weir. Located in marginal habitat.



Photo 8. Bradford Lateral. Located in marginal habitat.



Photo 9. Floyd's Weir. Located in marginal habitat.



Photo 10. Jones Weir. Located in suitable habitat.



Photo 11. Low Pump Heading and Drop Structure. Located in marginal habitat.



Photo 12. Peterson Lateral. Located in marginal habitat.



Photo 13. High Pump, west of Mixing Box. Located in suitable habitat.



Photo 14. Humpy South lined section. Located in suitable habitat.



Photo 15. Main South, south of Mixing Box, lined section. Located in suitable habitat.



APPENDIX D. All Project Work Locations, Giant Garter Snake Site-Specific Habitat Assessment Results, Temporary and Permanent Areas of Impact.

Site ID	Improvement Type Description	Latitude	Longitude	Total Aquatic Score	Total Upland Score	Total Upland Refugia Score	GGS Habitat Score	GGS Habitat Class	Total Area of Impact (ft ²)	Permanent Area of Impact	Temporary Area of Impact	Ground Disturbance	Equipment
Banyon Flume Resolution/Watts Heading	Replace board bays with metal slide gates and ITRC flap gate	39.508572	-121.702742	13	8	3	24	Suitable	NA	NA	NA	No	Flatbed truck (2 Axle) with crane
9010 Weir	Replace board bays with metal slide gates	39.508129	-121.722861	14	8	4	26	Suitable	NA	NA	NA	No	Flatbed truck (2 Axle) with crane
Ollies Weir/Humpy West/Humpy Weir*	Lined section, buried conduit (105 ft.), replace board bays with metal slide gates. Humpy West to be abandoned, boards removed.	39.479129	-121.78171	14	8	3	25	Suitable	10,198	1,193	9,005	Yes	Flatbed truck (2 Axle) with crane, excavator, skid-steer loader and trencher, dump truck, concrete mixer truck, concrete pump truck
Humpy South*	Lined Section, buried conduit (270 ft.)	39.477716	-121.777893	14	8	3	25	Suitable	9,605	1,515	8,090	Yes	Flatbed truck (2 Axle) with crane, excavator, skid-steer loader and trencher, dump truck, concrete mixer truck, concrete pump truck
Rystrom Weir	Replace board bays with metal slide gates	39.479195	-121.79122	13	8	3	24	Suitable	NA	NA	NA	No	Flatbed truck (2 Axle) with crane
Bradford Lateral	Weir box and RT bracket	39.493561	-121.773409	11	5	3	19	Marginal	4,040	40	4,000	Yes	Flatbed truck (2 Axle) with crane, excavator, skid-steer loader
Low Pump Heading and Drop Structure	New actuated radial gates	39.494295	-121.73094	9	5	3	17	Marginal	NA	NA	NA	No	Flatbed truck (2 Axle) with crane
Floyds Weir	Actuated slide gate-retrofit	39.500944	-121.727969	10	5	3	18	Marginal	NA	NA	NA	No	Flatbed truck (2 Axle) with crane

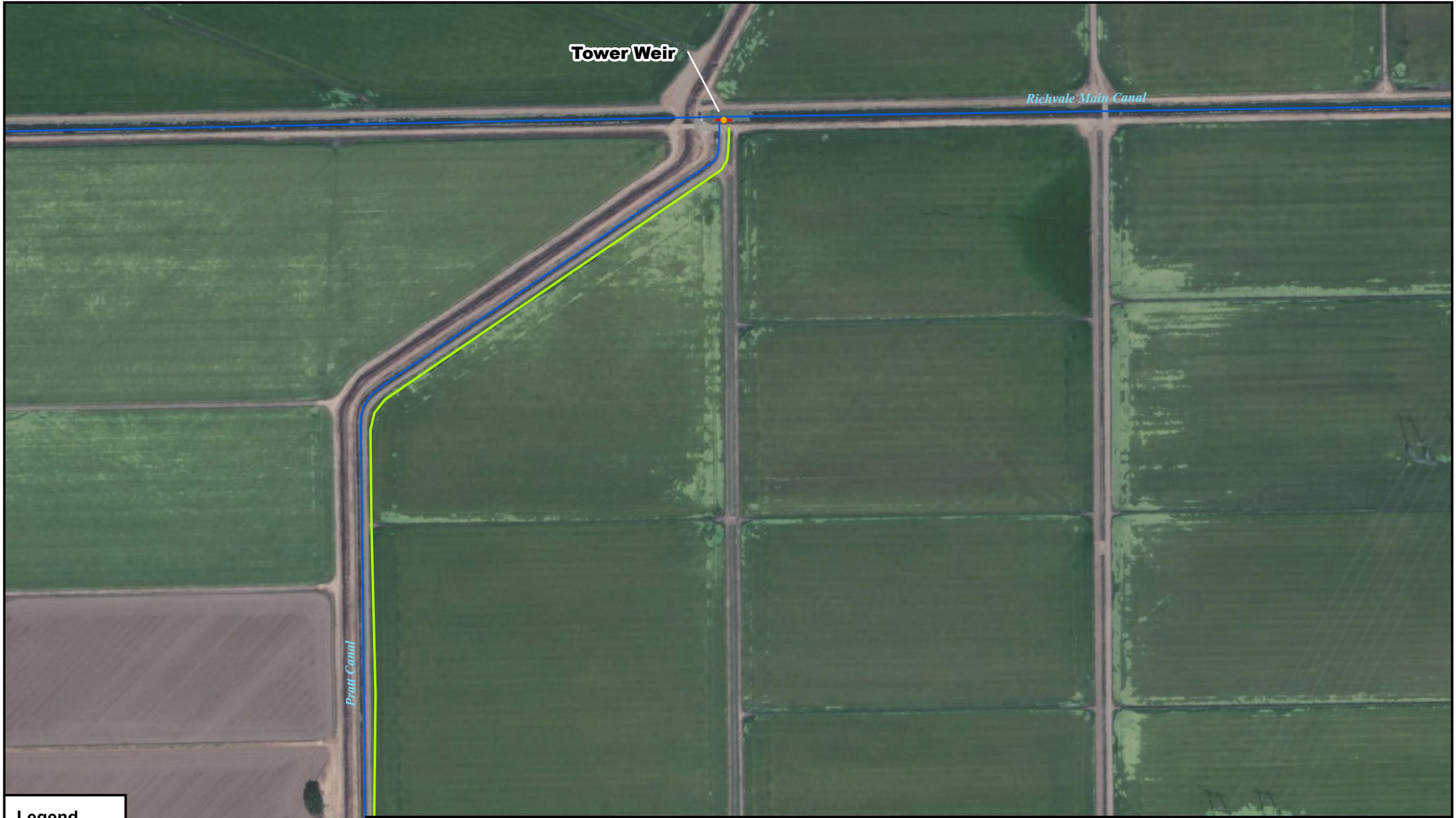
Site ID	Improvement Type Description	Latitude	Longitude	Total Aquatic Score	Total Upland Score	Total Upland Refugia Score	GGH Habitat Score	GGH Habitat Class	Total Area of Impact (ft ²)	Permanent Area of Impact	Temporary Area of Impact	Ground Disturbance	Equipment
Mixing Box*	Lined Sections, actuated slide gate-retrofit, replace 4 bays with slide gates at High Pump heading, buried conduit (470 ft.)	39.508129	-121.722861	11	6	3	20	Suitable	18,915	2,645	16,270	Yes	Flatbed truck (2 Axle) with crane, excavator, skid-steer loader and trencher, dump truck, concrete mixer truck, concrete pump truck
Tower Weir	Actuated slide gate-retrofit	39.508572	-121.702742	10	5	3	18	Marginal	NA	NA	NA	No	Flatbed truck (2 Axle) with crane
Peterson Lateral	Weir box and RT bracket	39.486534	-121.763558	11	5	3	19	Marginal	2,020	20	2,000	Yes	Flatbed truck (2 Axle) with crane, excavator, skid-steer loader
Jones Weir	Actuated slide gate-retrofit	39.479117	-121.768568	14	6	4	24	Suitable	NA	NA	NA	No	Flatbed truck (2 Axle) with crane

* Includes lined section of canal with concrete within GGS aquatic habitat

APPENDIX E. CNDDDB Giant Garter Snake Occurrence Records within 5 Miles of the Project (January 2019)

OccNumber	USGS 7.5' Topographic Quadrangle (s)	Date	County	Township	Range	Section
39	West of Biggs (3912147)	1992	Butte	T19N	R01E	34, NE (M)
97	West of Biggs (3912147)	1993	Butte Glenn	T19N	R01E	28, W (M)
98	West of Biggs (3912147)	1997	Butte Glenn	T19N	R01E	28, S (M)
99	West of Biggs (3912147)	1993	Butte Glenn	T18N	R01E	04, NW (M)
115	Nelson (3912157)	2010	Butte	T20N	R02E	29 (M)
116	Nelson (3912157)	NA	Butte	T20N	R02E	32, NE (M)
157	Biggs (3912146)	1999	Butte	T18N	R02E	03, SE (M)
213	Biggs (3912146)	1998	Butte	T19N	R02E	14 (M)
272	West of Biggs (3912147)	2007	Butte	T19N	R01E	21 (M)
304	Biggs (3912146)	2014	Butte	T19N	R03E	17, SE (M)
305	Biggs (3912146)	2011	Butte	T19N	R03E	31, SE (M)
342	Nelson (3912157)	2013	Butte	T20N	R02E	28, SW (M)
348	Shippee (3912156)	1942	Butte	T19N	R02E	04 (M)
365	Shippee (3912156)	2015	Butte	T20N	R02E	27, NW (M)
369	West of Biggs (3912147)	2013	Butte	T19N	R01E	25 (M)
408	Shippee (3912156)	2015	Butte	T20N	R02E	27, S (M)

Appendix C
Project Work Locations



Tower Weir

Richvale Main Canal

Pratt Canal

Legend

- Access Route
- Road
- Canal
- Drain
- Work Area

0 162.5 325 650 Feet

1 inch = 300 ft
(printed at 11" x 17")
Sheet 1 of 7



Within Township 19N, Range 02E, MDM
Shippe, Biggs, West of Biggs, & Nelson USGS 7.5' Quad

ImagerySource: Esri, DigitalGlobe, GeoEye, Earthstar Geographics,
CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User
Community

Original Map Date: September 3, 2019	NSE Project # 18-031	Created By: TA
---	-------------------------	-------------------

APE Map

**Richvale Irrigation District
Facilities Improvement Project
- Butte County, CA -**



NORTHSTAR

... Designing Solutions

111 MISSION RANCH BLVD., SUITE 100 CHICO, CA 95926
PHONE: (530) 893-1600 - www.NorthStarEng.com - © NorthStar



Legend

- Access Route
- Road
- Canal
- Drain
- Work Area



Within Township 19N, Range 02E, MDM
 Shippe, Biggs, West of Biggs, & Nelson USGS 7.5' Quad

ImagerySource: Esri, DigitalGlobe, GeoEye, Earthstar Geographics,
 CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User
 Community

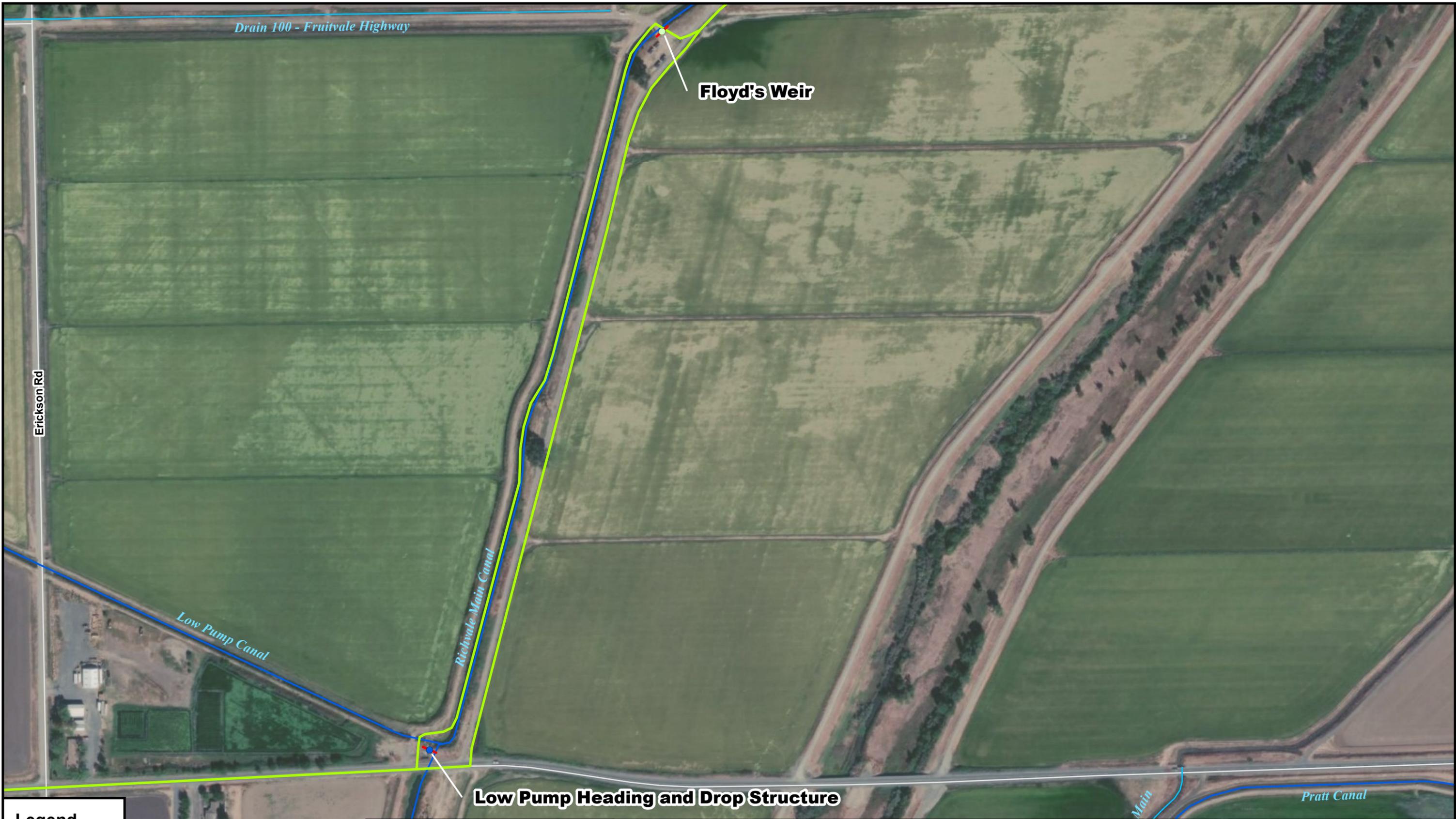
Original Map Date: September 3, 2019	NSE Project # 18-031	Created By: TA
---	-------------------------	-------------------

APE Map

Richvale Irrigation District
 Facilities Improvement Project
 - Butte County, CA -

NORTHSTAR
 ... Designing Solutions

111 MISSION RANCH BLVD., SUITE 100 CHICO, CA 95926
 PHONE: (530) 893-1600 - www.NorthStarEng.com - © NorthStar



<p>Legend</p> <ul style="list-style-type: none"> — Access Route — Road — Canal — Drain Work Area 	<p>0 162.5 325 650 Feet</p> <p>1 inch = 300 ft (printed at 11" x 17") Sheet 3 of 7</p> 	<p>Within Township 19N, Range 02E, MDM Shippe, Biggs, West of Biggs, & Nelson USGS 7.5' Quad</p> <p>ImagerySource: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community</p> <table border="1"> <tr> <td>Original Map Date: September 3, 2019</td> <td>NSE Project # 18-031</td> <td>Created By: TA</td> </tr> </table>	Original Map Date: September 3, 2019	NSE Project # 18-031	Created By: TA	<p style="text-align: center;">APE Map</p> <p style="text-align: center;">Richvale Irrigation District Facilities Improvement Project - Butte County, CA -</p>	 <p style="font-size: 24pt; font-weight: bold;">NORTHSTAR</p> <p style="font-size: 10pt;">... Designing Solutions</p> <p style="font-size: 8pt;">111 MISSION RANCH BLVD., SUITE 100 CHICO, CA 95926 PHONE: (530) 893-1600 - www.NorthStarEng.com - © NorthStar</p>
Original Map Date: September 3, 2019	NSE Project # 18-031	Created By: TA					



Legend

- Access Route
- Road
- Canal
- Drain
- Work Area

0 162.5 325 650 Feet

1 inch = 300 ft
(printed at 11" x 17")
Sheet 4 of 7



Within Township 19N, Range 02E, MDM
Shippe, Biggs, West of Biggs, & Nelson USGS 7.5' Quad

ImagerySource: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Original Map Date: September 3, 2019	NSE Project # 18-031	Created By: TA
---	-------------------------	-------------------

APE Map

Richvale Irrigation District
Facilities Improvement Project
- Butte County, CA -



NORTHSTAR

... Designing Solutions

111 MISSION RANCH BLVD., SUITE 100 CHICO, CA 95926
PHONE: (530) 893-1600 - www.NorthStarEng.com - © NorthStar



Watts Heading

Rystrom Weir

Banyon Flume Regulation

The Main Canal

Private Drain
Watts Canal

Drain 100 - Main

Legend

- Access Route
- Road
- Canal
- Drain
- Work Area

0 162.5 325 650 Feet

1 inch = 300 ft
(printed at 11" x 17")
Sheet 5 of 7



Within Township 19N, Range 02E, MDM
Shippe, Biggs, West of Biggs, & Nelson USGS 7.5' Quad

ImagerySource: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Original Map Date: September 3, 2019	NSE Project # 18-031	Created By: TA
---	-------------------------	-------------------

APE Map

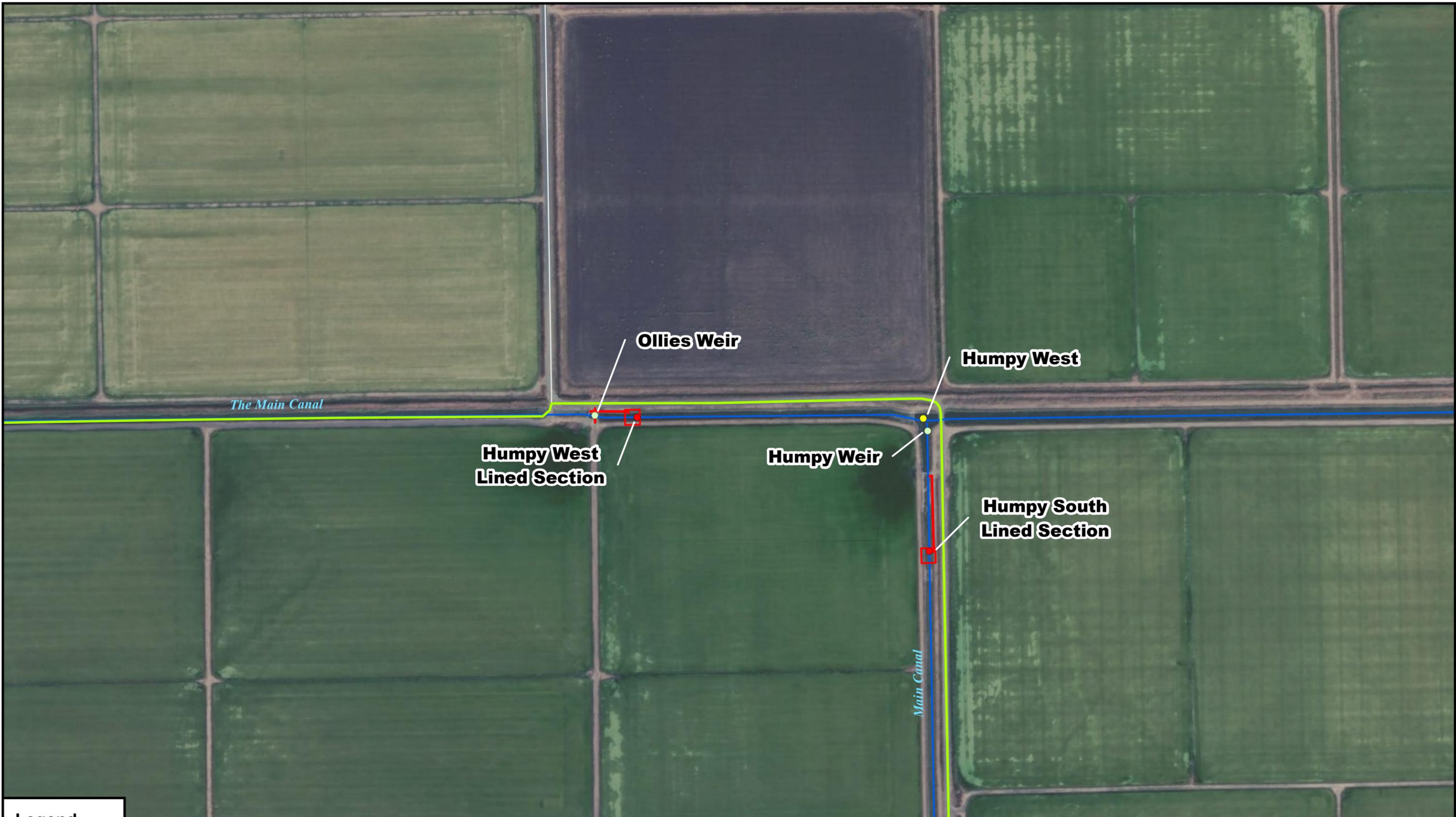
Richvale Irrigation District
Facilities Improvement Project
- Butte County, CA -



NORTHSTAR

... Designing Solutions

111 MISSION RANCH BLVD., SUITE 100 CHICO, CA 95926
PHONE: (530) 893-1600 - www.NorthStarEng.com - © NorthStar



Legend

- Access Route
- Road
- Canal
- Drain
- Work Area

0 162.5 325 650 Feet

1 inch = 300 ft
(printed at 11" x 17")
Sheet 6 of 7



Within Township 19N, Range 02E, MDM
Shippe, Biggs, West of Biggs, & Nelson USGS 7.5' Quad

ImagerySource: Esri, DigitalGlobe, GeoEye, Earthstar Geographics,
CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User
Community

Original Map Date: September 3, 2019	NSE Project # 18-031	Created By: TA
---	-------------------------	-------------------

APE Map

Richvale Irrigation District
Facilities Improvement Project
- Butte County, CA -



NORTHSTAR

... Designing Solutions

111 MISSION RANCH BLVD., SUITE 100 CHICO, CA 95926
PHONE: (530) 893-1600 - www.NorthStarEng.com - © NorthStar



Legend

- Access Route
- Road
- Canal
- Drain
- Work Area

0 162.5 325 650 Feet

1 inch = 300 ft
(printed at 11" x 17")
Sheet 7 of 7



Within Township 19N, Range 02E, MDM
Shippe, Biggs, West of Biggs, & Nelson USGS 7.5' Quad

ImagerySource: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Original Map Date: September 3, 2019	NSE Project # 18-031	Created By: TA
---	-------------------------	-------------------

APE Map

Richvale Irrigation District
Facilities Improvement Project
- Butte County, CA -



NORTHSTAR

... Designing Solutions

111 MISSION RANCH BLVD., SUITE 100 CHICO, CA 95926
PHONE: (530) 893-1600 - www.NorthStarEng.com - © NorthStar