DRAFT

Joint Environmental Assessment / Initial Study

and

Finding of No Significant Impact / Mitigated Negative Declaration

Antelope Creek Fish Passage Improvement Project

Tehama County, California

September 2019

Federal Lead Agency for NEPA
U.S. Fish and Wildlife Service
Red Bluff Fish and Wildlife Office
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List of Acronyms and Abbreviations

AB	Assembly Bill
AFRP	Anadromous Fish Restoration Program
AFSP	Anadromous Fish Screen Program
AG-1	Agriculture / Upland District
AG-2	Agricultural / Valley District
APE	Area of Potential Effect
BA	Biological Assessment
Basin Plan	Water Quality Control Plan for the Sacramento San Joaquin River Basin
BMP	Best Management Practice
BOR	Bureau of Reclamation
BRE	Biological Resources Evaluation
CA	State of California
CALFED	CALFED Bay-Delta Program
CARB	California Air Resources Board
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulation
cfs	Cubic Feet per Second
CH	Critical Habitat
CH4	Methane
CHP	California Highway Patrol
CCC	Criterion Continuous Concentration
CMC	Criterion Maximum Concentration
CNDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
CO2	Carbon Dioxide
CSRL	California Soil Resource Lab
CVPIA	Central Valley Project Improvement Act
DO	Dissolved Oxygen
DOORS	Diesel Off-Road On-Line Reporting System
DPS	Distinct Population Segment
DWR	California Department of Water Resources
EA / IS	Environmental Assessment / Initial Study

EDD	Edwards Diversion Dam
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Study
EPA	Environmental Protection Agency
ERPP	CALFED Bay-Delta Program Ecosystem Restoration Program Plan
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas
I-5	Interstate Highway 5
IWMP	Integrated Watershed Management Program
L	Liter
LEQ	Energy-Equivalent Level
LMMWC	Los Molinos Mutual Water Company
mg	Milligram
MMRP	Mitigation Monitoring and Reporting Program
MND	Mitigated Negative Declaration
N2O	Nitrous Oxide
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
NSVAB	Northern Sacramento Valley Air Basin
OHWM	Ordinary High Water Mark
PCE	Primary Constituent Element
PEIS	Programmatic Environmental Impact Statement
PERP	Portable Equipment Registration Program
PM10	Particulate Matter less than 10 Microns in Diameter
RCDTC	Resource Conservation District of Tehama County
RM	River Mile
ROG	Reactive Organic Gases
RPM	Resource Protection Measure
SR	State Route
SWRCB	State Water Resources Control Board
SubTerra	SubTerra Consulting, Archaeology and Paleontology
SVGB	Sacramento Valley Groundwater Basin
TAC	Project Technical Advisory Committee
TCAPCD	Tehama County Air Pollution Control District
TDS	Total Dissolved Solids
TES	Tehama Environmental Solutions, Inc.
ug	Micrograms
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VELB	Valley Elderberry Longhorn Beetle
VMT	Vehicle Miles Traveled

Finding of No Significant Impact
Antelope Creek Fish Passage Improvement Project

Lead Federal Agency:
U.S. Fish and Wildlife Service
2800 Cottage Way, Room W-2605
Sacramento, CA 95825

The U.S. Fish and Wildlife Service (USFWS) proposes to grant funds, under the authority of the Central Valley Project Improvement Act's (CVPIA) Anadromous Fish Screen Program (AFSP) to implement a fish passage improvement project on Antelope Creek at a site which currently hinders fish passage, near the Edwards Diversion Dam (EDD). The objectives of the project are as follows:

- Improve downstream passage between the EDD and the Sacramento River
- Reduce the risk of entrainment of fish in the ditches, and
- Improve the accuracy, precision and timing of irrigation diversions to LMMWC and the Edwards Ranch

The proposed project involves consolidating the two EDD diversions into the Los Molinos Mutual Water Company (LMMWC) Ditch (also called the east ditch), constructing an inverted siphon to route water from the LMMWC Ditch under New Creek to the Edwards Ditch (also called the west ditch), replacing the LMMWC Ditch fish screen and installing a new fish bypass system for the combined diversion screen. The proposed project also addresses the scour zone near the LMMWC headgate through the installation of rock scour hole repair. Earlier versions of the design included installation of an adjustable board structure in the fish ladder, but this element will instead be monitored in the near future to determine if the rock scour hole repair addresses the fish passage needs. Improving fish passage at this site would improve anadromous fish access to spawning, rearing and holding stream habitat upstream of the project site, and would improve anadromous fish passage downstream of the project site. The project is being implemented by the Resource Conservation District of Tehama County and the planning, design and implementation of the project is being funded by USFWS through the AFSP and Anadromous Fish Restoration Program (AFRP) and by the State Water Resources Control Board (SWRCB) through the Integrated Watershed Management Program. The USFWS is the lead agency under the National Environmental Policy Act. The RCDTC is the lead agency for the project under the California Environmental Quality Act.

The proposed action supports objectives of the AFRP Final Restoration Plan, complements other ongoing efforts to improve important aquatic habitats for the benefit of naturally-producing anadromous salmonids in the Central Valley, and may assist in the recovery of Central Valley steelhead and Central Valley spring-run Chinook salmon which are listed as threatened under the Endangered Species Act.

Documents reviewed in the preparation of this Finding of No Significant Impact (FONSI) include:

- CVPIA Programmatic Environmental Impact Statement (PEIS)
- AFRP Final Restoration Plan
- Environmental Assessment / Initial Study (EA / IS): Antelope Creek Fish Passage Improvement Project
- Intra-USFWS Section 7 Evaluation Form
- Section 7 Biological Opinion from the National Marine Fisheries Service
- Intra-USFWS Section 106 Consultation Compliance Memo

These documents are incorporated by reference, as described in 40 CFR 1508.13.

Alternatives

The five alternatives that were described and discussed by the project Technical Advisory Committee (TAC) included:

1. New Screens in Front of the Diversion Headgates
2. Siphon Bypass under New Creek
3. Crossing through New Creek
4. Combine the Diversions
5. Los Molinos Mutual Water Company Ditch Bypass Pipe Only

The preferred alternative is a revised version of alternative 4, "Combine the Diversions" which includes additional diversion capacity to the Edwards Ranch. The final preferred alternative was selected by the TAC due to the fact that it best met the multiple project objectives.

Fish passage improvement has been identified as priority actions in the CVPIA PEIS, AFRP Final Restoration Plan and CALFED's Ecosystem Restoration Plan, as well as several California Department of Fish and Wildlife publications and plans.

Environmental Impacts

Based upon information contained in the EA / IS, we have determined this Federal action would not significantly affect the quality of the human environment. The basis for a Finding of No Significant Impact is as follows:

1. As a result of formal consultation under the Endangered Species Act and inclusion of project design features / resource protection measures into the proposed action, short-term negative impacts to federally-listed or special-status species may occur, however long-term benefits would be realized. The short-term negative effects would not significantly affect the recovery of Central Valley spring-run Chinook salmon, fall- / late fall-run Chinook salmon or California Central Valley steelhead. No negative modification to designated critical habitats is expected. The short-term impacts are minimal compared to the potential net increase in production due to:
   a) Improved downstream passage between Edwards Diversion Dam and the Sacramento River due to a new fish screen and bypass return pipe in the LMMWCD and filling the scour zone
   b) Increased performance of the fish screen from bypass return pipe re-routing debris and ditch realignment
   c) Elimination of the risk of entrainment into the ditches
   d) Increased precision, accuracy and timing of diversions with infrastructure improvements
2. Short-term, minor impacts to wildlife and fisheries may occur from implementing activities related to the fish passage improvement. However, resource protection measures have been incorporated into the proposed action to minimize effects. The intent of this proposed action is to improve salmonid fish passage conditions, to reduce the risk of entrainment of fish in the ditches in the diversion system and to provide measurable, timely and accurate diversion amounts into each ditch. The proposed action would remediate the current passage impediment and risk of entrainment and by consolidating the two EDD diversions, constructing an inverted siphon, replacing the LMMWC Ditch fish screen, installing a new fish bypass system and installing rock scour hole repair. Additional work within the fish ladder may be needed in the future, but at this time this is just being monitored.
3. The proposed action is not expected to have long-term negative effects on wildlife or fisheries, and most effects are expected to be beneficial. The passage impediment, risk of entrainment, inaccuracy of diversion amounts within Antelope Creek and fish screen inefficiency would be improved and the planting of riparian vegetation would ensure that the proposed action does not result in a net loss of wetlands or riparian habitat.
4. Resource protection measures have been incorporated into the project as project design features

to minimize adverse effects on air quality, biological resources, cultural and tribal cultural resources, hazards / hazardous materials, hydrology / water quality and soils / geology / minerals. The proposed action is expected to have no negative impact on flooding potential.

5. The proposed action is not expected to have adverse effects on wetlands or floodplains pursuant to Executive Orders 11990 and 11988.
6. Neither short- nor long-term negative effects on human health or the environment, nor disproportionate adverse effects to low-income or minority populations are expected, pursuant to Executive Order 12898.
7. Based on field surveys and a cultural resources evaluation, the project would not significantly affect cultural resources. However, unknown subsurface cultural resources could be impacted during ground-disturbing activities associated with the proposed project. In the event subsurface cultural remains over 50 years of age are encountered during ground-disturbing activities, all work will cease at the general area of discovery and the U.S. Fish and Wildlife Service regional archaeologist, or other lead agency archaeologist, will be notified immediately.

In addition to analyzing effects on biological and cultural resources, the EA / IS evaluated the following aspects of the physical and human environment for potential significant effects as a result of the proposed action alternative:

- Aesthetics
- Agricultural / Forestry Resources
- Air Quality
- Cumulative Impacts
- Energy
- Environmental Justice
- Greenhouse Gas Emissions
- Hazards / Hazardous Materials
- Hydrology / Water Quality
- Land Use / Planning
- Noise
- Population / Housing
- Public Services / Utilities
- Recreation
- Soils / Geology / Minerals
- Transportation / Traffic
- Wildfire

Project design features to minimize environmental effects were incorporated into the proposed action alternative to reduce impacts to a level below significance for those issues for which potentially negative impacts were anticipated.

Public Review and Comment

An initial public scoping notice was published in the legal section of the Red Bluff Daily News on May 31, 2019. No comments were received.

Conclusion

Therefore, the USFWS, as lead Federal agency for the proposed AFSP funding of the Antelope Creek Fish Passage Improvement Project, has determined that the proposal does not constitute a major Federal action significantly affecting the quality of the human environment under the meaning of section 102(2)(c) of the National Environmental Policy Act of 1969 (as amended). As such, an Environmental Impact Statement is not required. An EA / IS has been prepared in support of this finding and is available upon request to the U.S. Fish and Wildlife Service, Red Bluff Fish and Wildlife Office, 10950 Tyler Road, Red Bluff, CA 96080.

_____ _____

Donald Ratcliff, Central Valley Supervisor Date

MITIGATED NEGATIVE DECLARATION
PROJECT TITLE:

ANTELOPE CREEK FISH PASSAGE IMPROVEMENT PROJECT

Project Description

The Resource Conservation District of Tehama County (RCDTC) has proposed a fish passage improvement project on Antelope Creek at a site which currently hinders fish passage, near the Edwards Diversion Dam (EDD), herein referred to as the Antelope Creek Fish Passage Improvement project and / or the project. The objectives of the project are as follows:

- Improve downstream passage between the EDD and the Sacramento River
- Reduce the risk of entrainment of fish in the ditches, and
- Improve the accuracy, precision and timing of irrigation diversions to Los Molinos Mutual Water Company (LMMWC) and the Edwards Ranch

The project includes improving conditions that currently hinder fish passage in Antelope Creek by consolidating the two EDD diversions into the LMMWC Ditch (also called the east ditch), constructing an inverted siphon to route water from the LMMWC Ditch under New Creek to the Edwards Ditch (also called the west ditch), replacing the LMMWC Ditch fish screen and installing a new fish bypass system for the combined diversion screen. The proposed project also addresses the scour zone near the LMMWC headgate through the installation of rock scour hole repair. Earlier versions of the design included installation of an adjustable board structure in the fish ladder, but this element will instead be monitored in the near future to determine if the rock scour hole repair addresses the fish passage needs.

The project is being funded by the State Water Resources Control Board through the California Clean Water, Clean Air, Safe Neighborhood Parks, and Coastal Protection Act of 2002 (Proposition 40) Integrated Watershed Management Program and by the U.S. Fish and Wildlife Service through the Anadromous Fisheries Screen Program and the Anadromous Fish Restoration Program. The RCDTC is the lead agency for the project under the California Environmental Quality Act. The USFWS is the lead agency under the National Environmental Policy Act.

Findings

The USFWS and RCDTC have prepared an Environmental Assessment (EA) / Initial Study (IS) for this project, and the RCDTC has determined from this study that the proposed project would not have a significant effect on the environment for the following reasons:

- The project will result in a net benefit to Chinook salmon, steelhead and other aquatic fish and wildlife species by improving fish passage conditions.
- The project will improve anadromous fish passage at the project site through fish screen modifications, installation of a bypass return pipe and filling a scour zone.
- Project impacts will be temporary in nature.
- The project incorporates all applicable mitigation measures, as listed below and described in the EA / IS.

The proposed project will have a less-than-significant impact or no impact as related to aesthetics, agricultural / forestry resources, energy, greenhouse gas emissions, land use / planning, noise, population / housing, public services / utilities, recreation, and transportation / traffic.

Potential project impacts will be reduced to a level of less-than-significant through adherence to established best management practices (BMPs) and implementation of mitigation measures related to air quality, biological resources, cultural and tribal cultural resources, hazards / hazardous materials, hydrology / water quality, soils / geology / minerals and wildfires. The following mitigation measures will be implemented as part of the project to avoid or minimize potential environmental impacts. Implementation of these mitigation measures would reduce the potential environmental impacts of the proposed project to a less-than-significant level.

- **AIR-1:** Standard Mitigation Measures for Construction Equipment

  i. Maintain all construction equipment in proper tune according to manufacturer's specifications.
  ii. Maximize to the extent feasible, the use of diesel construction equipment meeting current CARB certification standards for off-road heavy-duty diesel engines.
  iii. Registration in the CARB DOORS program (www.arb.ca.gov/msprog/ordiesel/ordiesel.htm) and meeting all applicable standards for replacement and/or retrofit.
  iv. All portable equipment, including generators and air compressors rated over 50 brake horse power, registered in the Portable Equipment Registration Program (www.arb.ca.gov/portable/portable.htm), or permitted through the District as a stationary source.

  Discretionary Mitigation Measures for Construction Equipment

  i. Electrify equipment where feasible.
  ii. Substitute gasoline-powered for diesel-powered equipment, where feasible.
  iii. Use alternatively fueled construction equipment on site where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane, or biodiesel.
  iv. Use equipment that has Caterpillar pre-chamber diesel engines

- **AIR-2:** A Fugitive Dust Permit shall be obtained from the Tehama County Air Pollution Control District (TCAPCD), if required.
- **AIR-3**: Land Clearing / Earth Moving and Compliant Signage: Water shall be applied by means of truck(s), hoses and/or sprinklers as needed prior to any land clearing or earth movement to minimize dust emission. Water shall be applied to disturbed areas a minimum of 2 times per day or more as necessary. Post a publicly visible sign with the telephone number and person to contact regarding dust complaints. This person shall respond and take corrective action within 24 hours. The telephone number of the District shall also be visible to ensure compliance with District Rule 4:1 & 4:24 (*Nuisance and Fugitive Dust Emissions*).

  Visibly Dry Disturbed Soil Surface Areas, Unpaved Roads, and Gravel: All visibly dry disturbed soil surface areas of operation shall be treated with a dust palliative agent and/or watered to minimize dust emission. All visibly dry disturbed unpaved roads surface areas of operation shall be watered to minimize dust emission. Unpaved roads may be graveled to reduce dust emissions.

  Paved Road Track-Out and Haul Vehicles: Existing roads and streets adjacent to the project will be cleaned at least once per day unless conditions warrant a greater frequency. Haul vehicles transporting soil into or out of the property shall be covered. Haul roads shall be sprayed down at the end of the work shift to form a thin crust. This application of water shall be in addition to the minimum rate of application.

  Vehicles Entering/Exiting Construction Area and Employee Parking: Vehicles entering or exiting construction area shall travel at a speed which minimizes dust emissions. Construction workers shall park in designated parking areas(s) to help reduce dust emissions. On-site vehicles limited

to a speed which minimizes dust emissions on unpaved roads.

Soil Piles: Soil pile surfaces shall be moistened if dust is being emitted from the pile(s). Adequately secured tarps, plastic or other material may be required to further reduce dust emissions.

- **VEGETATION-1:** Disturbance to existing vegetation will be avoided or minimized to the extent possible.
- **VEGETATION-2:** Disturbance to riparian vegetation will be avoided or minimized to the extent possible.
- **VEGETATION-3:** All heavy equipment shall be thoroughly cleaned prior to mobilization onsite to remove any soil, weed seeds and plant parts to reduce the importation and spread of invasive exotic plant species.
- **VEGETATION-4:** Only certified weed-free straw shall be used for erosion control or other purposes to reduce the importation and spread of invasive exotic plant species.
- **VEGETATION-5:** A revegetation plan will be prepared in coordination with the landowner to replace impacted riparian wetlands and other woody vegetation by a measure of quantity and quality equal to, or exceeding impacts of the project using appropriate native riparian trees and shrubs.
- **VEGETATION-6:** Road improvement and grading activities shall be conducted in such a manner that disturbances are confined to the already disturbed road prism.
- **VEGETATION-7:** No smoking will be allowed on the construction site or within the project area, for fire prevention purposes.
- **VEGETATION-8:** White-stemmed clarkia plants within the project site will be flagged for avoidance. Construction crews will be educated regarding their presence and the appropriate avoidance measures to take for this species.
- **FISH-1:** The National Marine Fisheries Service (NMFS) shall be consulted to 1) develop appropriate avoidance and minimization measures, and 2) determine whether an Endangered Species Act Section 7 take permit will be required for the project. All protective measures imposed by NMFS through the consultation process shall be adhered to.
- **FISH-2:** Instream work can occur between July 1 and September 30. Instream work could start sooner if the California Department of Fish and Wildlife (CDFW) determines that the adult CV spring-run Chinook salmon are no longer present based on environmental conditions and real time passage data. Instream work could be extended to October 14, if environmental conditions which would preclude juvenile steelhead and spring-run Chinook salmon emigration or adult steelhead and late fall-run Chinook salmon immigration are expected to persist. Instream work outside of the July 1 to September 30 work window must be approved by CDFW and NMFS on a case-by-case basis with details on how take will be avoided and / or minimized.
- **FISH-3:** All construction debris (concrete, metal etc.) from the fish passage improvement-related construction activities will be removed from the active stream channel post-construction.
- **FISH-4:** Immediately prior to instream work, a qualified fish biologist, in coordination with CDFW, will conduct surveys above and below the area to be dewatered, to identify presence of salmonids. The Resource Conservation District of Tehama County (RCDTC), in coordination with the contractor, and in consultation with NMFS and CDFW, will ensure that qualified fish biologists are onsite to implement fish rescue operations within the dewatered area through the use of herding, seining and / or electrofishing, if necessary. Best professional determination will be used to decide which method(s) of rescue is to be used and where the relocation of captured fish, either upstream or downstream of the temporary dams is to occur. Biologists will first try to haze and herd fish out of the fish exclusion area. If fish biologists determine that the use of electrofishing is necessary for the efficient and successful removal of fish, NMFS electrofishing guidelines (National Marine Fisheries Service 2000) will be strictly followed. The fish rescue

team will be comprised of fishery biologists with professional experience using seines and electrofishing equipment. The same methodologies will be used during dewatering of the diversion ditches.

- **FISH-5:** All water pumps used during construction shall be screened to meet CDFW and NMFS criteria, unless deemed unnecessary by CDFW and NMFS (i.e. if water was being diverted from an off-channel pool). The refueling of pumps will occur away from the wetted area / channel. If pumps are using fuel, they will be outfitted with a spill kit.
- **FISH-6:** All dewatering and rewatering activities will be conducted slowly, in order to minimize disturbance to fish. A qualified fisheries biologist will be onsite during these activities, and CDFW will be notified prior to these activities.
- **FISH-7:** All reasonable measures will be taken to minimize impacts to lamprey, including spending more time at the area as it becomes dewatered (and they are moving out of the mud, chasing the water as it recedes), and possibly electroshocking.
- **FISH-8:** Appropriate measures will be used to avoid the spread of aquatic invasive species such as zebra / quagga mussels, New Zealand mudsnails and chytrid fungus to and from the project area according to the current CDFW Aquatic Invasive Species Disinfection / Decontamination Protocols (Northern Region) and the current U.S. Fish and Wildlife Service (USFWS) Red Bluff Fish and Wildlife Office Anadromous Fish Restoration Program Hazard Analysis Critical Control Point Plan.
- **WILDLIFE-1:** Within seven (7) calendar days prior to the onset of potentially disturbing construction activities, areas that will be disturbed within 100 feet of water bodies shall be surveyed by a qualified biologist to determine if any western pond turtles or turtle nests are present. If any turtles or turtle nests are found, a qualified and permitted biologist shall determine and implement appropriate relocation procedures, in coordination with California Department of Fish and Wildlife (CDFW). The site shall be checked daily by trained construction workers prior to work commencing, including underneath vehicles and equipment that will be used. If turtles are found, they will be moved by a qualified and permitted biologist to an area of safety out of harm's way.
- **WILDLIFE-2:** Within seven (7) calendar days prior to work in aquatic habitats, water bodies shall be surveyed by a qualified biologist to determine if any foothill yellow-legged frogs are present. If any foothill yellow-legged frogs are found, a qualified and permitted biologist shall determine and implement appropriate relocation procedures, in coordination with CDFW. The site shall be checked daily by trained construction workers prior to work commencing, including underneath vehicles and equipment that will be used. If foothill yellow-legged frogs are found, they will be moved by a qualified and permitted biologist to an area of safety out of harm's way.
- **WILDLIFE-3:** Any tree removal, vegetation clearing, or the onset of potentially disturbing construction activities shall occur between September 1 and January 1 (outside of the nesting season for raptors with potential to occur within, or in the vicinity of the project site). Note: Also see measure WILDLIFE-4.

  If tree removal, vegetation clearing, or the onset of potentially disturbing construction activities must occur during the nesting season, a raptor nesting survey of the construction area and adjacent suitable habitat shall be conducted by a qualified biologist no more than seven (7) calendar days prior to the initiation of the onset of these activities or as appropriate survey protocols require. If active raptor nests are found to be present, tree removal, vegetation clearing and the onset of potentially disturbing construction activities shall be suspended until a qualified biologist, in consultation with CDFW and / or USFWS can establish an appropriate protective buffer area to minimize impacts to the nesting raptors. No construction activities shall commence within the buffer area until the qualified biologist determines that the young birds have fledged or the nest is no longer active.

Construction activities shall occur continuously (not including weekends) until the end of the nesting season to discourage raptors from initiating nesting. If construction activities cease for more than seven (7) consecutive days (including weekends), all construction activities shall cease until CDFW can be consulted to determine if a subsequent raptor nesting survey must be performed.

Active or inactive nests are not to be disturbed or removed as a result of construction activities without CDFW consultation per Fish and Game Code Section 3503.5.

- **WILDLIFE-4:** Any tree removal, vegetation clearing, or the onset of potentially disturbing construction activities shall occur between August 1 and March 1 (outside of the nesting season for grasshopper sparrow, yellow-breasted chat, loggerhead shrike, yellow warbler and other nesting migratory birds). Note: Also see measure WILDLIFE-3.

  If tree removal, vegetation clearing, or the onset of potentially disturbing construction activities must occur during the nesting season, a nesting survey of the construction area and adjacent suitable habitat shall be conducted by a qualified biologist no more than seven (7) calendar days prior to the initiation of the onset of these activities. If active bird nests are found to be present, tree removal, vegetation clearing and the onset of potentially disturbing construction activities shall be suspended until a qualified biologist, in consultation with CDFW, can establish an appropriate protective buffer area to minimize impacts to the nesting birds. No construction activities shall commence within the buffer area until the qualified biologist determines that the young birds have fledged or the nest is no longer active.

  Construction activities shall occur continuously (not including weekends) until the end of the nesting season to discourage avian species from initiating nesting. If construction activities cease for more than seven (7) consecutive days (including weekends), all construction activities shall cease until CDFW can be consulted to determine if a subsequent nesting bird survey must be performed.

  Active nests are not to be disturbed or removed as a result of construction activities per Fish and Game Code Section 3503.

- **WILDLIFE-5:** Prior to the onset of potentially disturbing construction activities during the nesting season, a Swainson's hawk nesting survey of the construction area and adjacent suitable habitat shall be conducted by a qualified biologist in accordance with the protocols in *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee 2000). If active Swainson's hawk nests are found to be present, the onset of potentially disturbing construction activities shall be suspended until a qualified biologist, in consultation with CDFW, can establish an appropriate protective buffer area to minimize impacts to the nesting birds. No construction activities shall commence within the buffer area until the qualified biologist determines that the nest is no longer active.
- **WILDLIFE-6:** Prior to any vegetation removal, an attempt will be made by a qualified biologist to determine if pallid bats, Townsend's big-eared bats or western red bats are roosting in the area to be removed / disturbed.

  If pallid bats, Townsend's big-eared bats or western red bats are found to be roosting within the area to be removed / disturbed, these activities shall be suspended until a qualified biologist, in consultation with CDFW, can establish appropriate measures to minimize impacts to these species.

- **WILDLIFE-7:** To the extent possible, all direct disturbance to identified bat roosts shall occur between August 31 and May 1, in order to minimize the likelihood of injuring or killing juvenile bats during the period when they are still unable to fly.

- **WILDLIFE-8:** To the extent possible, the removal of trees or branches with defects (cavities, cracks, exfoliating bark, etc.) that provide potential bat roosting or bird roosting / nesting habitat will be avoided.
- **WILDLIFE-9:** As appropriate, revegetation efforts will incorporate tree and vine species that are known to be used by western red bats for roosting including, but not limited to white alder *(Alnus rhombifolia)*, California sycamore *(Platanus racemosa)*, pipevine *(Aristolochia californica*) and California grape *(Vitis californica)*.
- **WILDLIFE-10:** Prior to the onset of construction activities, a construction worker education program shall be implemented that includes an explanation of all special-status animal species, identification, avoidance measures, and federal and state laws that protect the species. This shall include, at a minimum, those species described in the environmental documents.
- **WILDLIFE-11:** Prior to the onset of construction activities, a qualified biologist will inspect the project site for signs of denning by ringtails.

  If ringtails are found to be denning, construction activities will be suspended until a qualified biologist, in consultation with CDFW, can establish appropriate measures to protect ringtail.
- **WILDLIFE-12:** The project shall comply with the current Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*) (U.S. Fish and Wildlife Service 2017).
- **WILDLIFE-13:** The USFWS shall be consulted to 1) develop appropriate avoidance and minimization measures, and 2) determine whether an Endangered Species Act Section 7 take permit will be required for the project. All protective measures imposed by USFWS through the consultation shall be adhered to.
- **WILDLIFE-14:** Prior to construction, all elderberry shrubs to be avoided within 150 feet of any project activity will be clearly flagged, marked and maintained throughout construction in order to avoid impacts to the valley elderberry longhorn beetle. All elderberry shrubs to be avoided within 100 feet of project activity will be marked with high-visibility orange fencing.
- **WILDLIFE-15:** Signs will be installed every 50 feet, on the fencing of all elderberry shrubs within 100 feet of any project related activities with the following information: "This area is habitat for the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." Signs will be clearly readable from a distance of 20 feet and will be maintained for the duration of construction.
- **WILDLIFE-16:** Prior to construction, elderberry shrubs which cannot be avoided by project related activities with one or more stems measuring 1.0 inch or greater in diameter at ground level shall be transplanted onsite.

  A qualified biologist (monitor) must be onsite for the duration of the transplanting of the elderberry plants to insure that no unauthorized take of the valley elderberry longhorn beetle occurs. If unauthorized take occurs, the monitor must have the authority to stop work until corrective measures have been completed and must immediately report any unauthorized take of the beetle or its habitat to the USFWS and to CDFW.

  Elderberry shrubs will be transplanted during dormancy, from November 1 through the first two weeks of February, after the shrubs have lost their leaves, following the specific transplanting guidance provided in the *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus)* (U.S. Fish and Wildlife Service 2017).

- **WILDLIFE-17:** A qualified biologist (biological monitor) shall regularly inspect construction-related activities to ensure that no unnecessary disturbance to special-status species and / or their associated habitats occurs. The biological monitor shall have the authority to stop all activities that may result in such disturbance until appropriate corrective measures have been completed. The biologist will also be required to report any unauthorized take to CDFW, USFWS and / or NMFS immediately.
- **WILDLIFE-18:** All food-related trash will be disposed of in closed containers and removed from the project area daily during the construction period. Construction personnel will not feed or otherwise attract wildlife to the project area.
- **WILDLIFE-19:** No pets will be allowed within the project area.
- **WETLAND-1:** Project activities will avoid impacts to wetlands and other aquatic habitats to the extent possible.
- **WETLAND-2:** High-visibility fencing will be installed in areas where equipment will be working near any wetlands and / or riparian habitat that are not to be disturbed.
- **WETLAND-3:** Construction crews will be informed about the importance of avoiding sensitive areas, including wetlands.
- **WETLAND-4:** A Clean Water Act Section 404 Permit will be obtained from the U.S. Army Corps of Engineers and a Clean Water Act Section 401 Certification will be obtained from the Central Valley Regional Water Quality Control Board (RWQCB).
- **WETLAND-5:** A California Fish and Game Code Section 1600 Lake or Streambed Alteration Agreement will be obtained from CDFW.
- **CULTURAL-1:** Cultural resource site EAD-CR-1 shall be considered environmentally sensitive and no use or modification of the site shall occur. Prior to the onset of construction, the boundary of the site shall be marked with high-visibility fencing and / or flagging and the need to avoid disturbance of the site shall be included in the environmental awareness training for project personnel.
- **CULTURAL-2:** Cultural resource site EAD-CR-2 shall be considered environmentally sensitive and no use or modification of the site shall occur. Use and modification of the existing roadbed adjacent to the site may occur but shall be confined to the existing road footprint not to extend more than 15 feet on either side of the existing road centerline. Prior to the onset of construction, the 15 foot buffer shall be marked with high-visibility fencing and / or flagging and the need to avoid disturbance of the site shall be included in the environmental awareness training for project personnel.
- **CULTURAL-3:** In the event subsurface archaeological resources are encountered during ground-disturbing activities, all work will cease at the general area of discovery and the USFWS regional archaeologist, or other lead agency archaeologist, will be notified immediately. A field exam by a professional archaeologist may be required and further steps for resource protection will be implemented, including mitigation and consultation with the Native American Indian community if human remains are encountered (following Native American Graves Protection and Repatriation Act procedures). Work may proceed on other parts of the project site while mitigation for historical, unique archaeological or tribal resources is being carried out.
- **HAZ-1:** A designated concrete washout area will be located at least 100 feet from any high water mark within adjacent waterways, and from any wetlands and will be developed and used following the U.S. Environmental Protection Agency Storm Water BMP for a Concrete Washout.
- **HAZ-2:** BMPs will be developed and implemented to ensure that wet concrete and concrete grindings do not enter Antelope Creek, New Creek, wetlands or other aquatic sites during construction.
- **HAZ-3:** Measures WATER-3 through WATER-5 associated with potential petroleum product spills will be fully implemented.

- **HAZ-4:** Construction equipment and materials shall not be stored or stockpiled in the creek channel, and shall be stored at least 50 feet from the top of the stream bank, any wetlands or other aquatic sites.
- **WATER-1:** All instream construction shall be conducted in the summer / early fall during the low flow period (see measure FISH-2). Any work within the channel and banks, outside of this instream work window must be isolated from flowing water and dewatering will be required.
- **WATER-2:** Monitoring of water turbidity and settleable materials shall be conducted in accordance with the Clean Water Act Section 401 Certification through consultation with RWQCB.
- **WATER-3:** All equipment and machinery that contains fuel, oil or other petroleum products used during construction related activities shall be checked for petroleum leaks immediately prior to being mobilized to the project site and again each day prior to use.
- **WATER-4:** All equipment refueling and / or maintenance shall take place within a secondary containment structure and a minimum of 100 feet away from Antelope Creek, New Creek, any wetlands or other aquatic sites.
- **WATER-5:** An emergency spill kit and absorbent oil booms will be onsite during construction activities.
- **WATER-6:** A dewatering permit will be obtained from the RWQCB, if deemed necessary based on the dewatering methods used.
- **WATER-7:** All equipment operations within the channel and banks of Antelope Creek and New Creek will be required to use readily biodegradable hydraulic oil.
- **SOIL / GEO / MIN-1:** After ground-disturbing activities are complete, all disturbed areas (outside of the active stream channels and the ditch bottoms) shall be seeded with native plant species and mulched as approved by the landowner and described in the revegetation plan and the Storm Water Pollutions Prevention Plan (SWPPP), if required.
- **SOIL / GEO / MIN-2:** Construction of all project actions shall comply with the RWQCB Basin Plan Objectives and an erosion control plan. Standard Best Management Practices (BMPs) will be incorporated into the project designs and / or the SWPPP, if required.
- **SOIL / GEO / MIN-3:** If the total disturbance area is greater than one acre, a Notice of Intent will be submitted to the State Water Resources Control Board to obtain coverage under the National Pollution Discharge Elimination System General Permit for Discharges of Storm Water Associated with Construction Activity.
- **WF-1:** All designated parking areas shall be kept free of dry vegetation before and during construction. Before construction begins, signage shall be installed at the entrance to the project site that prohibits parking outside of designed parking areas. Where heavy equipment or generators are used, fire extinguishers shall be made available on, or nearby the equipment.

_____ _____

Vicky Dawley, District Manager Date

Project Title:

Antelope Creek Fish Passage Improvement Project

Lead Agencies Name and Address:

The Resource Conservation District of Tehama County (RCDTC) is the lead agency under the California Environmental Quality Act (CEQA). The U.S. Fish and Wildlife Service (USFWS) is the lead agency under the National Environmental Policy Act (NEPA). Contact information for the lead agencies are listed below:

Resource Conservation District of Tehama County

Mr. Jon Barrett, Project Manager
2 Sutter Street, Suite D
Red Bluff, CA 96080
(530) 727-1293
jon@tehamacountyrcd.org

U.S. Fish and Wildlife Service

Mr. Jim Earley, Fish Biologist / Habitat Restoration Coordinator
Red Bluff Fish and Wildlife Office
10950 Tyler Road
Red Bluff, CA 96080
(530) 527-3043, ext. 261
james_earley@fws.gov

Project Location:

The project is located on private property, approximately three miles east of Red Bluff, in Tehama County, California (Figure 1). Specifically, the site is located in an unsurveyed portion of Township 27 North, Range 2 West, Mount Diablo Base and Meridian, within the 7.5-minute U.S. Geological Survey (USGS) Red Bluff East quadrangle map (Figure 2). The project is located near the Edwards Diversion Dam (EDD) on Antelope Creek, at approximately nine stream miles upstream of the confluence with the Sacramento River, and on New Creek approximately four stream miles upstream of the confluence with Salt Creek, a tributary to the Sacramento River. The project includes the initial approximately 600-foot-long reaches of the Edwards Ditch (also called the west ditch) and the Los Molinos Mutual Water Company (LMMWC) Ditch (also called the west ditch), both of which divert water at the EDD (Figure 3 and Figure 4).

General Plan Designation:

The Tehama County General Plan designation for the project site is Valley Floor Agriculture and Upland Agriculture.

Zoning:

The Tehama County zoning designation for the project site is zoned Agricultural / Upland district and Agricultural / Valley district.

1.0 Introduction

Overview

Under the authority of the Central Valley Project Improvement Act (CVPIA), USFWS has developed an Anadromous Fish Restoration Program (AFRP) with the broad goal of doubling natural production of anadromous fish (those that spawn in fresh water but spend their adult life in salt water) in the rivers and streams of the Central Valley. Under the authority of the CVPIA, the USFWS has also developed the Anadromous Fish Screen Program (AFSP), with the broad goal of protecting juvenile anadromous fish from entrainment in water diversions in California on the Sacramento and San Joaquin Rivers, their tributaries, and the Sacramento-San Joaquin Delta.

In March 2002, California voters approved the California Clean Water, Clean Air, Safe Neighborhood Parks, and Coastal Protection Act of 2002 (Proposition 40), which created the Integrated Watershed Management Program (IWMP). One of the many purposes of the IWMP was to establish a program for integrated watershed management, to protect and restore habitat and fisheries (Public Resources Code, Section 30945).

The AFRP, AFSP, IWMP and other ecosystem restoration programs have recommended a fish passage improvement project (hereafter referred to as project, proposed project or proposed action) on Antelope Creek at the EDD. The objectives of the project are as follows:

- Improve downstream passage between the EDD and the Sacramento River
- Reduce the risk of entrainment of fish in the ditches, and
- Improve the accuracy, precision and timing of irrigation diversions to LMMWC and the Edwards Ranch

Fish passage deficiencies exist within both ditches at the EDD diversion facilities and at the EDD. Without bypass returns and sufficient flows, debris routing and the performance of the fish screens is inadequate and water diversion capabilities are diminished (Davids Engineering 2017). Additionally, there is a deep scour zone located immediately upstream of the LMMWC Ditch headgate that attracts fish to the area exposing them to emigration delays and being swept into the diversion canal.

The proposed project involves consolidating the two EDD diversions into the LMMWC Ditch, constructing an inverted siphon to route water from the LMMWC Ditch under New Creek to the Edwards Ditch, replaces the LMMWC Ditch fish screen and installs a new fish bypass system for the combined diversion screen. The proposed project also addresses the scour zone near the LMMWC headgate through the installation of rock scour hole repair. Earlier versions of the design included installation of an adjustable board structure in the fish ladder, but this element will instead be monitored in the near future to determine if the rock scour hole repair addresses the fish passage needs. Improving fish passage at this site would improve anadromous fish access to spawning, rearing and holding stream habitat upstream of the project site, and would improve anadromous fish passage downstream of the project site. The project is being implemented by RCDTC and the planning, design and implementation of the project is being funded by USFWS through the AFSP and AFRP and by the State Water Resources Control Board (SWRCB) through the IWMP.

Purpose of This Document

This Joint Environmental Assessment (EA) / Initial Study (IS) was prepared by Tehama Environmental Solutions, Inc. (TES) under subcontract to the TCRCD under agreement number D1512701 with the SWRCB. The EA / IS has been prepared to comply with both the National Environmental Policy Act (NEPA) (42 United States Code 4331 *et seq.)* and the California Environmental Quality Act (CEQA) (California Public Resources Code, Sections 21000 *et seq.*). The USFWS is the lead agency under NEPA and the RCDTC is the lead agency under CEQA.

The purpose of this EA / IS is twofold. Under NEPA, the purpose is to determine whether the proposed action would result in significant effects on the environment, which would then require the preparation of an

Environmental Impact Statement (EIS), or alternatively, whether the level of effects on the environment are such that a Finding of No Significant Impact (FONSI) can be supported by the federal lead agency. Similarly, under CEQA, the purpose is to determine whether the proposed project would result in significant effects on the environment, which would require the preparation of an Environmental Impact Report (EIR), or alternatively, whether the level of effects on the environment are such that a Negative Declaration or a Mitigated Negative Declaration (MND) can be supported by the state lead agency.

This EA / IS describes the environmental resources in the project area, analyzes the effects of the Proposed Action and a No Action alternative on the environment, and proposes avoidance, minimization and / or mitigation measures to reduce any effects to less than significant levels.

Project Location

The proposed project is located in the Sacramento Valley portion of the Antelope Creek watershed, approximately three miles east of Red Bluff, in Tehama County, California (Figure 1). Specifically, the site is located in an unsurveyed portion of Township 27 North, Range 2 West, Mount Diablo Base and Meridian, within the 7.5-minute U.S. Geological Survey (USGS) Red Bluff East quadrangle map (Figure 2). The project is located near the EDD on Antelope Creek, at approximately nine stream miles upstream of the confluence with the Sacramento River, and on New Creek approximately four stream miles upstream of the confluence with Salt Creek, a tributary to the Sacramento River. The project includes the initial approximately 600-foot-long reaches of the Edwards Ditch and the Los Molinos Mutual Water Company (LMMWC) Ditch, both of which divert water at the EDD (Figure 3 and Figure 4). Photos of the project site are provided as Figure 5 through Figure 13.

The proposed project is located on three remote private parcels of varying acreage which comprise the project site and the unpaved access haul road to reach the site. The Tehama County Assessor's Parcel Numbers include 049-150-002, 049-150-001 and 049-040-008.

Purpose and Need for Action

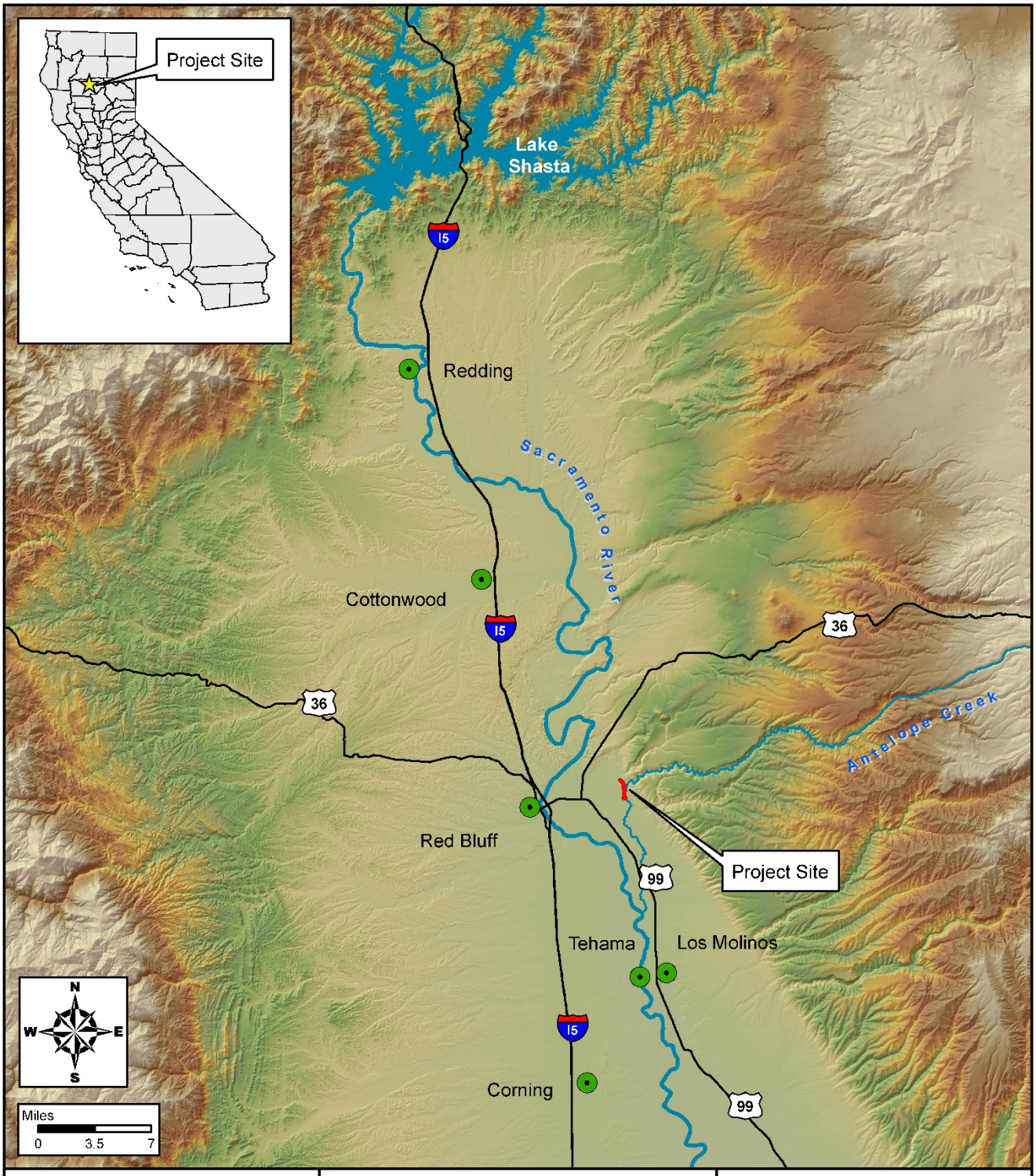
NEPA regulations require the federal lead agency to describe the underlying purpose and need to which the agency is responding, when considering a project, while the CEQA Guidelines require that the state lead agency provide a "statement of objectives sought by the proposed project" (Council on Environmental Quality [CEQ] and Governor's Office of Planning and Research 2014). The information in this section addresses both of these requirements by providing information as to why USFWS and the RCDTC are considering the proposed project.

Purpose

The purpose of the proposed project is to improve passage for migrating native adult and juvenile fish at the EDD, to reduce juvenile entrainment at the EDD diversions and to improve the accuracy, precision and timing of irrigation diversions.

Need

The modifications at the project site are needed to improve fish passage conditions for native anadromous fish, including several federal and state listed species. The new infrastructure will allow greater flexibility in managing flows for agricultural and fish passage purposes, as outlined in a past Memorandum of Agreement between CDFW, the Edwards Ranch and LMMWC (California Department of Fish and Wildlife et al. 2017), a future Lake and Streambed Alteration Agreement between the Edwards Ranch and CDFW, and a future Operations and Maintenance Agreement between the Edwards Ranch, LMMWC, CDFW, USFWS and NMFS.



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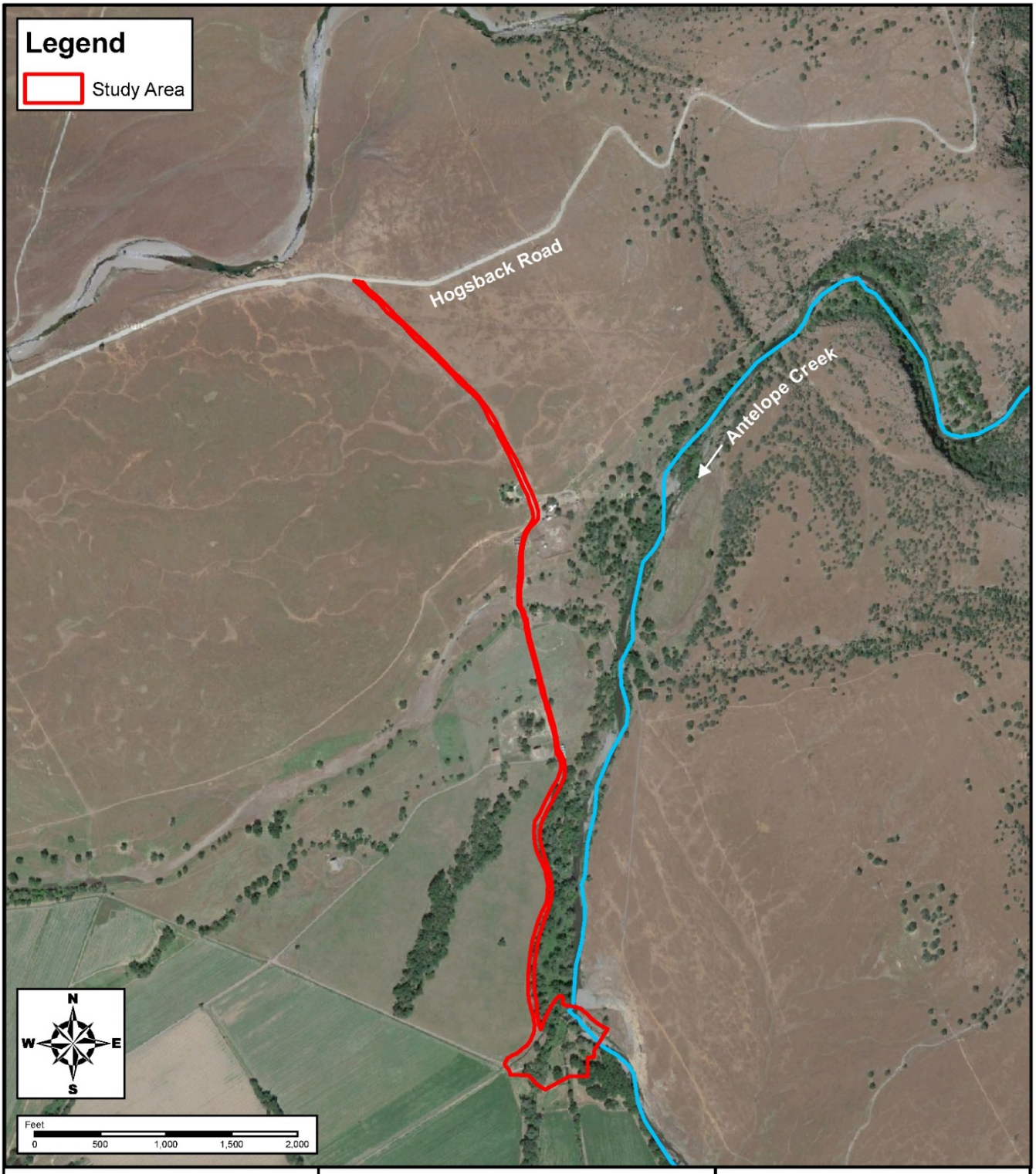
Antelope Creek
Fish Passage Improvement Project

Tehama County, California

September 2019

FIGURE 1

Site Vicinity Map



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Antelope Creek Fish Passage Improvement Project

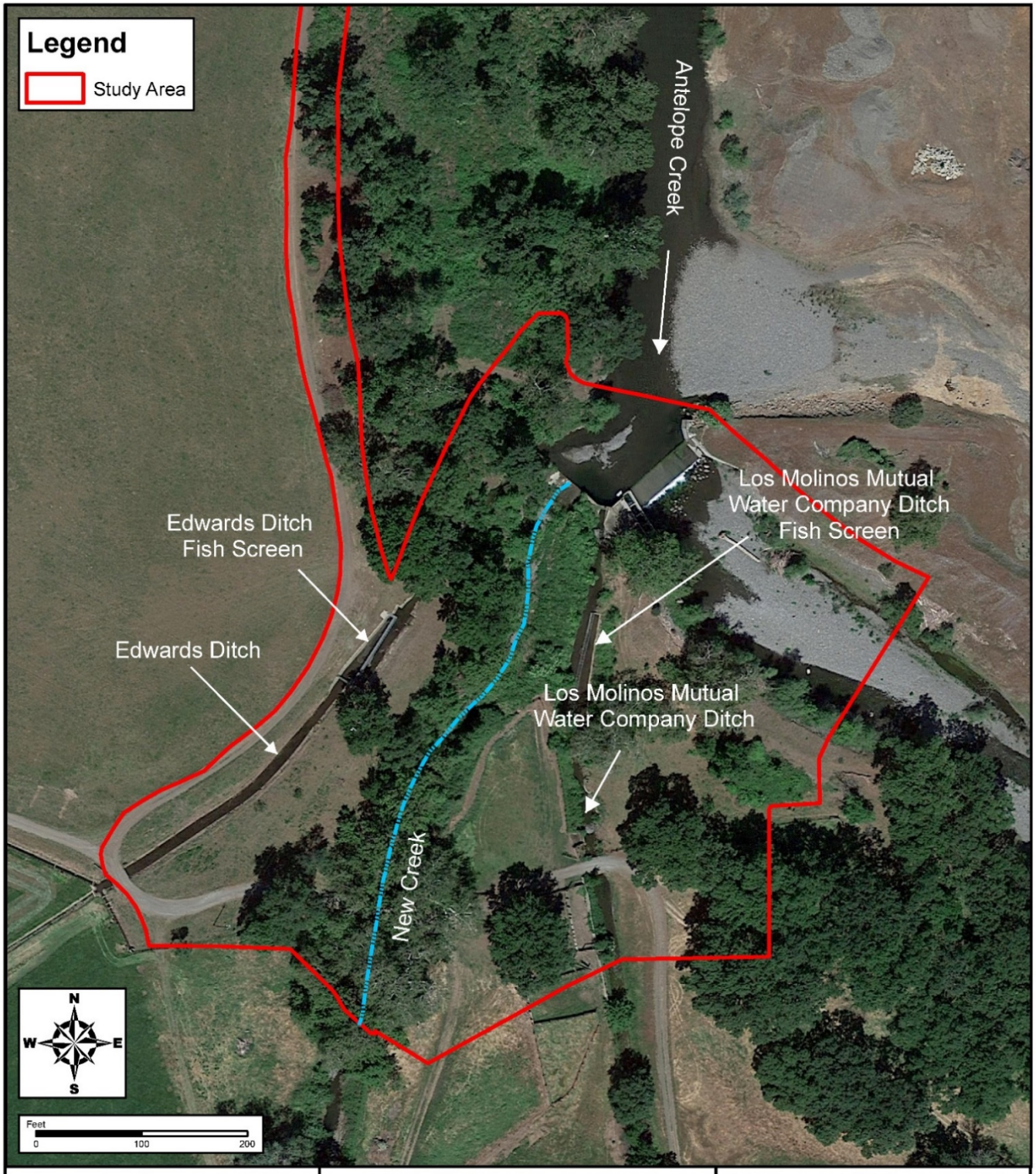
Tehama County, California

September 2019

FIGURE 2

Project Overview Map

PHOTO SOURCE: Google Earth, 4/15/2015



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Antelope Creek Fish Passage Improvement Project

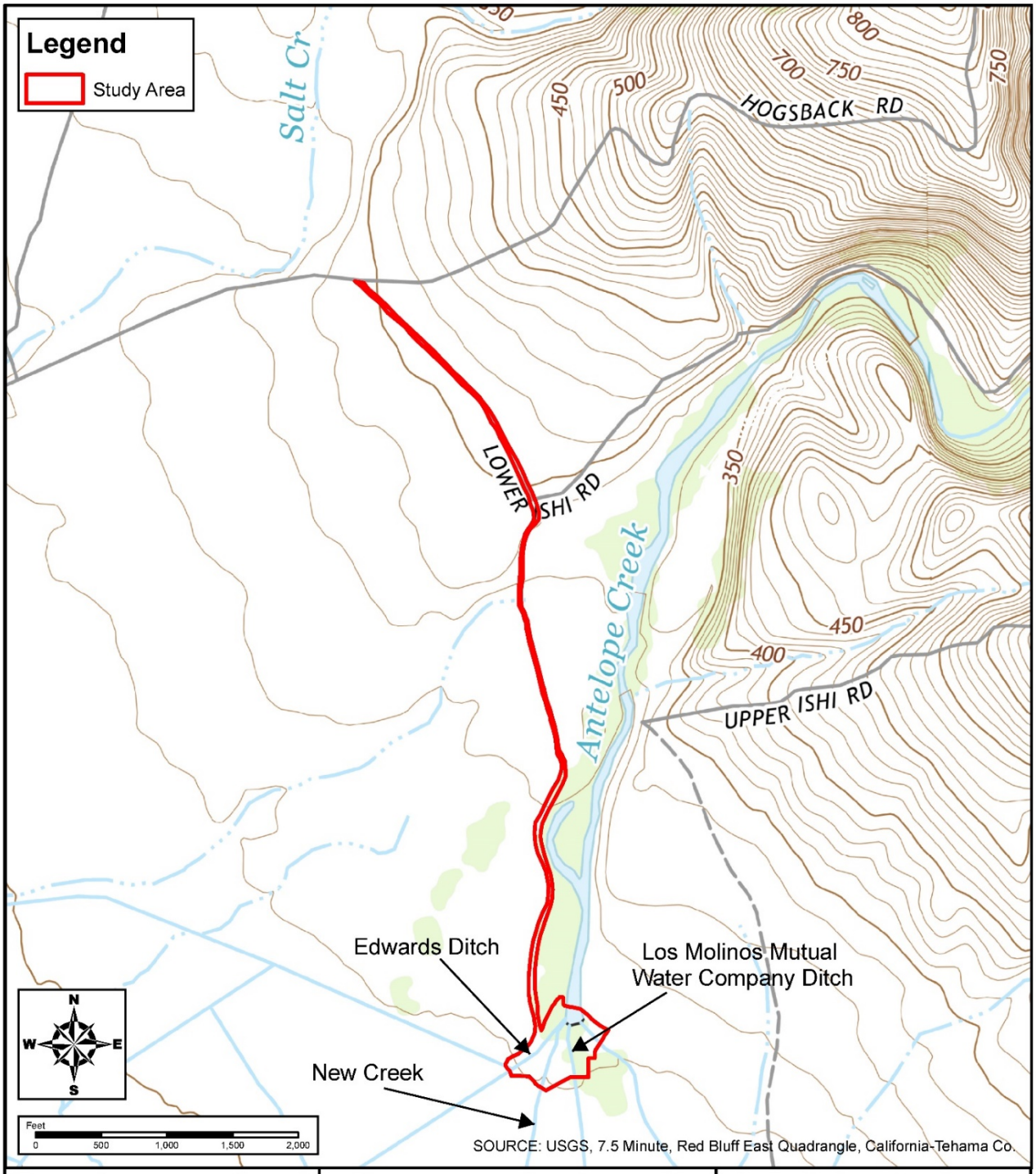
Tehama County, California

September 2019

FIGURE 3

Site Aerial Photo Map

PHOTO SOURCE: Google Earth, 4/15/2015



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Antelope Creek Fish Passage Improvement Project

Tehama County, California

September 2019

FIGURE 4

Site Location Map

Figure 5. View of the Edwards Diversion Dam and Fishway

View of the Edwards Diversion Dam and fish ladder on Antelope Creek, looking north.

Photo date: May 2016.

Figure 6. View of Antelope Creek

View of Antelope Creek upstream of the Edwards Diversion Dam, looking north.

Photo date: May, 2016.

Figure 7. View of New Creek

View of New Creek from an existing bridge, looking downstream to the southwest.

Photo date: May, 2016.

Figure 8. View of the Los Molinos Mutual Water Company Ditch Fish Screen

View of the Los Molinos Mutual Water Company Ditch and fish screen, looking upstream to the northeast.

Photo date: May, 2016.

Figure 9. View of the Edwards Ditch

View of the Edwards Ditch downstream of the fish screen, looking downstream to the southwest.

Photo date: May, 2016.

Figure 10. View of the Edwards Ditch Fish Screen

View of the Edwards Ditch and fish screen, looking upstream to the northeast.

Photo date: May, 2016.

Figure 11. View of the Los Molinos Mutual Water Company Ditch

View of the Los Molinos Mutual Water Company Irrigation Ditch, looking downstream to the southwest.

Photo date: May, 2016.

Figure 12. View of Valley Foothill Riparian Habitat

View of valley foothill riparian habitat near Antelope Creek, looking northwest.

Photo date: May, 2016.

Figure 13. View of Valley Oak Woodland Habitat

View of valley oak woodland habitat near Antelope Creek, looking southeast.

Photo date: May, 2016.

The AFRP, AFSP and other ecosystem restoration programs have recommended improving fish passage in Central Valley streams as a high priority for the CVPIA. Multiple fisheries agencies have identified the EDD on Antelope Creek as a potential site for improving passage conditions for several species of anadromous fish.

The EDD, originally constructed in 1912, is a private diversion dam that diverts Antelope Creek into the Edwards Ditch and the LMMWC Ditch. A concrete sill at the EDD also controls flow into New Creek. The ditches are maintained and operated by the Edwards Ranch and LMMWC. The EDD is part of a private stream diversion system that supplies irrigation water for agricultural uses on the Edwards Ranch and for lands owned by shareholders of the LMMWC. The EDD and the Edwards Ditch are owned by the Edwards Ranch and the structures and associated infrastructure of the LMMWC Ditch are owned by LMMWC.

Antelope Creek provides critical migration, spawning, and rearing habitat for the state and federally listed Central Valley spring-run Chinook salmon *(Oncorhynchus tshawytscha)*, the federally listed Central Valley steelhead *(Oncorhynchus mykiss)*, the fall- / late fall-run Chinook salmon *(Oncorhynchus tshawytscha)* and other native fish. The EDD, located at the project site, was built to increase the water levels of Antelope Creek to allow irrigation diversions for the two entities with water rights. Both ditches are equipped with fish screens which were originally installed by CDFW in 1976; however, they were not installed with fish bypass return systems. Without bypass returns and sufficient bypass flows, fish screen performance and water diversion capabilities are diminished and debris routing is compromised and as a consequence, regular maintenance is required. CDFW regularly checks the fish screens within each ditch during the period of downstream salmonid migration to rescue and return trapped juvenile salmonids to Antelope Creek.

As a result of the needs identified above, the objectives for this proposed project are as follows:

- Improve downstream passage between the EDD and the Sacramento River
- Reduce the risk of entrainment of fish in the ditches, and
- Improve the accuracy, precision and timing of irrigation diversions to LMMWC and the Edwards Ranch

Antelope Creek Fish Passage Improvement Project Technical Advisory Committee

The project was developed through a collaborative process by a Technical Advisory Committee (TAC) composed of representatives from the SWRCB, Central Valley Regional Water Quality Control Board (RWQCB), USFWS, National Marine Fisheries Service (NMFS), CDFW, U.S. Bureau of Reclamation, LMMWC, RCDTC, the Edwards Ranch and several private consulting firms.

Regulatory Framework

In addition to CEQA and NEPA, the proposed project is subject to a variety of federal, state, and local laws, regulations and policies as identified in Section 5 Compliance with Environmental Laws and Regulations of this document. The proposed project would require several federal, state, and local agency permits and approvals prior to implementation (Table 1).

Table 1. Required Permits and Approvals	
Permits and Approvals	Agency
FEDERAL	
Clean Water Act Section 404 Permit	U.S. Army Corps of Engineers
Endangered Species Act Section 7 Consultation	National Marine Fisheries Service & U.S. Fish and Wildlife Service
STATE	
Clean Water Act Section 401 Water Quality Certification	Central Valley Region Water Quality Control Board
Lake or Streambed Alteration Agreement	California Department of Fish and Wildlife
California Endangered Species Act	California Department of Fish and Wildlife
Encroachment Permit	Central Valley Flood Protection Board
Construction General Stormwater Permit	California State Water Resources Control Board
National Historic Preservation Act Section 106 Consultation	California State Office of Historic Preservation
National Pollutant Discharge Elimination System Dewatering And Other Low Threat Discharges To Surface Waters Permit*	Central Valley Regional Water Quality Control Board
LOCAL	
Tehama County Fugitive Dust Permit**	Tehama County Air Pollution Control District
Building and Grading Permits**	Tehama County Public Works Department

*May be required depending on the method of dewatering proposed.
** May be required.

2.0 Proposed Action and Alternatives

Alternative Development

The project was developed as a collaborative effort with participation from many different disciplines represented by local, state and federal entities. The TAC was made up of engineers, geologists and environmental scientists, water managers and landowners which were involved with the design process and instrumental with the selection of a preferred alternative.

Since 2008, the TAC has held multiple meetings, field visits, tours and discussions with the landowner (Edwards Ranch) and the LMMWC to discuss the project. During the design process, several surveys and investigations were conducted to determine the existing conditions and potential project impacts including, but not limited to target species investigations, water temperature, and salmonid habitat water rights investigations, topographic surveys, draft construction designs and specifications, hydrologic and hydraulic surveys, geologic investigations, botanical surveys, wetland delineations, habitat assessments, fish migration barrier assessments, wildlife surveys, archaeological surveys and environmental reviews. A technical report was produced in 2011 which included an alternatives analysis to identify solutions for improving fish passage at the project site (Vestra Resources Inc. and the Resource Conservation District of Tehama County 2011).

The alternatives which were described and discussed by the TAC and were included in the 2011 report include:

1. New Screens in Front of the Diversion Headgates
2. Siphon Bypass under New Creek
3. Crossing through New Creek
4. Combine the Diversions
5. Los Molinos Mutual Water Company Ditch Bypass Pipe Only

In 2013, the TAC developed a revised version of "Combine the Diversions" (listed above) which was regarded as the preferred solution and included the provision for additional diversion capacity to the Edwards Ranch and the construction of a fish bypass system to New Creek. In 2015, RCDTC secured additional funding from the SWRCB and AFSP for the design and construction of the preferred alternative and hired Davids Engineering Inc. as the design engineer. Davids Engineering prepared several versions of an Options Analysis through which it was determined that a key component of the revised preferred solution (the proposed West Ditch fish screen bypass to New Creek) was in violation of California Fish and Game Code (Davids Engineering 2017). The preferred solution was then further discussed, and ideas were pursued or discarded based on merit and group consensus, until the preferred alternative was further refined into the proposed action as described below and further described in the *Antelope Creek Fish Passage Improvement Project: 60% Basis of Design Report* (Davids Engineering et al. 2018).

No Action Alternative

Under this alternative, no changes would occur to the existing diversion infrastructure at the EDD. No changes would occur to any of the headgates, fish screens or ditches. No changes would occur to the scour zone upstream of the EDD and the LMMWC Ditch headgate or to the fish ladder on the EDD. The lack of bypass return pipes at the fish screens would continue to entrain juvenile salmonids and other native fish at the fish screens, which would not meet current NMFS and CDFW fish passage criteria during all flows.

Proposed Action Alternative (Alternative 4 [Revised])

TAC members agreed that the preferred alternative would involve:

- Combination of both diversions at the LMMWC Ditch headgate
- Modification of the LMMWC Ditch between the headgate and the fish screen
- Installation of a new fish screen in the LMMWC Ditch along with a fish bypass return pipe to Antelope Creek
- Installation of an inverted siphon from the LMMWC Ditch, under New Creek and into the Edwards Ditch
- Installation of flow spilt and monitoring structures within the siphon and LMMWC Ditch
- Installation of rock scour hole repair upstream of the LMMWC Ditch headgate
- Modification to the fish ladder on the EDD

This alternative was then further developed through a design process. Below is a bulleted list of the design features followed by a more detailed description of each aspect of the project. Further information is provided in the 100% Design Plan Drawings which are included in Appendix A.

<u>Los Molinos Mutual Water Company Ditch</u>

- Install new fish screen
- Install fish bypass return pipe to Antelope Creek
- Install an inverted siphon from the LMMWC Ditch to the Edwards Ditch under New Creek
- Install headgates to split flows between the siphon and the LMMWC Ditch
- Install flow measurement devices

<u>Edwards Ditch</u>

- Install siphon discharge structure

<u>Edwards Diversion Dam</u>

- Installation of rock scour hole repair upstream of the LMMWC Ditch headgate
- Monitor the area in front of the LMMWC Ditch headgate for holding fish; if fish are found to be holding, the fish ladder may be modified

<u>Other Project Items</u>

- Site access
- Flow diversions during construction, dewatering and rewatering
- Fish rescue operations
- Revegetation
- Pre- and Post-Construction Monitoring

Los Molinos Mutual Water Company Ditch

The Edwards Ranch and LMMWC diversions would be combined into the LMMWC Ditch through the existing concrete headgate and wooden gate which would be retained, however the gate would remain fully open during normal operating conditions. Therefore, at zero diversion flow, the water surface elevation upstream of the Edwards Dam and the water surface elevation in the upper reach of the diversion channel will be equal, and nearly equal when diversions occur. A new trash rack upstream of the headgate would also be installed. The ditch would be modified in shape, alignment and / or size to provide the design flow capacity and most efficiently accommodate a new larger fish screen. A new chevron-style (v-screen) fish screen will be installed to accommodate the combined diversion flows. A new fish bypass return pipe, constructed to meet applicable CDFW and NMFS guidelines, would be installed to return juvenile fish back to Antelope Creek from the LMMWC Ditch fish screen. The bypass return pipe would also improve debris management within the

ditch near the fish screen and allow for fish entrained in the ditch to be returned to Antelope Creek, providing an alternative to the current practice which includes CDFW personnel regularly checking the fish screens and rescuing and returning fish to Antelope Creek, or New Creek depending on flows. A siphon would be installed under New Creek to convey water from the LMMWC Ditch to the Edwards Ditch. After crossing under New Creek, the inverted siphon will discharge into a short section of concrete-lined intertie ditch that connects to the existing Edwards Ditch. Downstream of the new fish screen, new flow control structures would be installed including a new headwall downstream of the fish screen and three headgates installed to regulate flow to either the LMMWC Ditch or into the inverted siphon leading to the Edwards Ditch. The three new headgates will be operated to control the diversion rates with improved operational efficiency and hydraulic control and will allow for flows to be split between diverters. An acoustic Doppler flow measurement device would be installed in the siphon and in the LMMWC Ditch in order to enable accurate measurements and management of diverted flows.

Edwards Ditch

The existing Edwards Ditch headgate and existing fish screen will be abandoned in place. A concrete siphon discharge structure will be constructed to transition the siphon flow into the Edwards Ditch.

Edwards Diversion Dam

An approximately 1,600-square-foot scour zone pool exists upstream of the LMMWC Ditch headgate and New Creek apron and the EDD fish ladder. The depth of the pool ranges from four to ten feet. The scour zone will be filled with California Department of Transportation Class 2-ton rock to an elevation of approximately two feet below the invert elevation of the LMMWC Ditch. It is anticipated that the interstitial spaces in the rock will fill over time with sands and gravels. This will enhance the effectiveness of the existing fish ladder during periods when fish are out-migrating.

Other Project Items - Site Access

Access to the site is from Hogsback Lane. Several alternative project staging areas are proposed for the project site (Appendix A). Some clearing of woody vegetation within riparian areas along New Creek and Antelope Creek will be required to construct the siphon and fish bypass pipe. Additional riparian vegetation will be disturbed to widen the LMMWC ditch. The contractor will be responsible for restoring the access haul road from Hogsback Road and the staging areas to the condition that existed prior to construction.

Flow Diversions during Construction, Dewatering and Rewatering

Construction of the new fish screen, headgates, siphon and bypass return pipe will require isolation of the construction areas from water in Antelope Creek, New Creek and the two ditches. Work has been scheduled in two phases to allow construction work within streams and ditches to occur at times of low, or no flows. Where necessary, isolation structures would likely consist of a water-filled bladder or gravel bags, or other suitable materials and would be placed so that flows will be directed around the project sites. The sites would be dewatered to accommodate construction activities and then rewatered following the completion of construction. All instream work will be completed by September 30, or by October 14 with CDFW and NMFS approval. The scour hole repair work will be done in-water and will not include dewatering activities.

Fish Rescue Operations

CDFW biologists will conduct fish rescue operations during dewatering of Antelope Creek, New Creek and the two ditches for salmonids and other species of concern. The construction contractor will be responsible for coordinating dewatering activities with CDFW fish rescue activities and will be required to dewater the creek slowly.

Revegetation

Vegetation to be removed will be restored upon completion of the project, as required. A revegetation plan will be prepared to replace impacted vegetation by a measure of quantity and quality equal to or exceeding impacts of the project using appropriate native plant species. Following construction, disturbed vegetated areas would be revegetated in accordance with the revegetation plan. Revegetation would occur between November and April and include the use of a crew of three to four workers and may include the use of a small excavator or backhoe. Following revegetation, additional maintenance activities would be required to care for the trees and shrubs planted as a part of the revegetation plan. Work would include irrigation, replanting and non-native plant removal, as needed. Only minimal wading in water would occur for revegetation and maintenance activities. Personnel would be trained to avoid any impacts to salmonid and Pacific lamprey redds during these activities.

Pre- and Post-Construction Monitoring

Pre- and post-construction monitoring will be conducted. Activities may include pre-construction biological surveys, as-built surveys, initial post-construction monitoring of hydraulic structures, biological monitoring for salmonid passage success by CDFW and post-construction site inspection and maintenance. These activities would also require access along the existing access road.

Project Schedule

The proposed action will be implemented in two phases. Phase 1 will occur outside of the irrigation season from November 1 through March 30 and include the in-canal work consisting of:

- Vegetation removal
- Grading and preparation of partial work sites and staging areas
- Fish screen
- LMMWC Ditch diversion channel
- Diversion / flow control headwalls
- Connections to the siphon pipeline
- Connections to the bypass pipeline
- Siphon discharge structure in the Edwards Ditch

Phase 2 will occur during the irrigation season as early as July 1 through November 1 and include the instream work consisting of:

- Grading and preparation of remaining work sites and staging areas
- Siphon pipeline installation
- Juvenile bypass pipeline installation
- Rock scour hole repair
- Final site clean-up and demobilization

All instream work will be completed by September 30, or by October 14 with CDFW and NMFS approval. The project is anticipated to begin construction in the fall of 2019 and end in the fall of 2020, assuming the timely acquisition of all environmental permits. If all environmental permits are not acquired prior to the fall of 2019, the project may begin in the summer of 2020 and be completed in the fall / winter of 2020 / 2021.

Operation and Maintenance

An Operations and Maintenance Agreement is currently being coordinated and prepared between CDFW, NMFS, USFWS, LMMWC and the Edwards Ranch which will memorialize responsibilities for maintaining the

condition of the fish screens, bypass return pipe, inverted siphon and headgates and under what conditions the diversions, bypass pipes and fish ladder will be operated to maintain acceptable fish passage conditions.

Requirements and Mitigations Incorporated into the Proposed Action

The project includes a number of Resource Protection Measures (RPMs) that were developed to protect sensitive resources that could potentially be impacted by the project and are hereby incorporated into the project description and plans. These RPMs and project components are summarized below:

- **AIR-1:** Standard Mitigation Measures for Construction Equipment

  i. Maintain all construction equipment in proper tune according to manufacturer's specifications.
  ii. Maximize to the extent feasible, the use of diesel construction equipment meeting current CARB certification standards for off-road heavy-duty diesel engines.
  iii. Registration in the CARB DOORS program (www.arb.ca.gov/msprog/ordiesel/ordiesel.htm) and meeting all applicable standards for replacement and/or retrofit.
  iv. All portable equipment, including generators and air compressors rated over 50 brake horse power, registered in the Portable Equipment Registration Program (www.arb.ca.gov/portable/portable.htm), or permitted through the District as a stationary source.

  Discretionary Mitigation Measures for Construction Equipment

  i. Electrify equipment where feasible.
  ii. Substitute gasoline-powered for diesel-powered equipment, where feasible.
  iii. Use alternatively fueled construction equipment on site where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane, or biodiesel.
  iv. Use equipment that has Caterpillar pre-chamber diesel engines

- **AIR-2:** Fugitive Dust Permits shall be obtained from the Tehama County Air Pollution Control District (TCAPCD).
- **AIR-3**: Land Clearing / Earth Moving and Compliant Signage: Water shall be applied by means of truck(s), hoses and/or sprinklers as needed prior to any land clearing or earth movement to minimize dust emission. Water shall be applied to disturbed areas a minimum of 2 times per day or more as necessary. Post a publicly visible sign with the telephone number and person to contact regarding dust complaints. This person shall respond and take corrective action within 24 hours. The telephone number of the District shall also be visible to ensure compliance with District Rule 4:1 & 4:24 (*Nuisance and Fugitive Dust Emissions*).

  Visibly Dry Disturbed Soil Surface Areas, Unpaved Roads, and Gravel: All visibly dry disturbed soil surface areas of operation shall be treated with a dust palliative agent and/or watered to minimize dust emission. All visibly dry disturbed unpaved roads surface areas of operation shall be watered to minimize dust emission. Unpaved roads may be graveled to reduce dust emissions.

  Paved Road Track-Out and Haul Vehicles: Existing roads and streets adjacent to the project will be cleaned at least once per day unless conditions warrant a greater frequency. Haul vehicles transporting soil into or out of the property shall be covered. Haul roads shall be sprayed down at the end of the work shift to form a thin crust. This application of water shall be in addition to the minimum rate of application.

  Vehicles Entering/Exiting Construction Area and Employee Parking: Vehicles entering or exiting construction area shall travel at a speed which minimizes dust emissions. Construction workers shall park in designated parking areas(s) to help reduce dust emissions. On-site vehicles limited to a speed which minimizes dust emissions on unpaved roads.

Soil Piles: Soil pile surfaces shall be moistened if dust is being emitted from the pile(s). Adequately secured tarps, plastic or other material may be required to further reduce dust emissions.

- **VEGETATION-1:** Disturbance to existing vegetation will be avoided or minimized to the extent possible.
- **VEGETATION-2:** Disturbance to riparian vegetation will be avoided or minimized to the extent possible.
- **VEGETATION-3:** All heavy equipment shall be thoroughly cleaned prior to mobilization onsite to remove any soil, weed seeds and plant parts to reduce the importation and spread of invasive exotic plant species.
- **VEGETATION-4:** Only certified weed-free straw shall be used for erosion control or other purposes to reduce the importation and spread of invasive exotic plant species.
- **VEGETATION-5:** A revegetation plan will be prepared in coordination with the landowner to replace impacted riparian wetlands and other woody vegetation by a measure of quantity and quality equal to, or exceeding impacts of the project using appropriate native riparian trees and shrubs.
- **VEGETATION-6:** Road improvement and grading activities shall be conducted in such a manner that disturbances are confined to the already disturbed road prism.
- **VEGETATION-7:** No smoking will be allowed on the construction site or within the project area, for fire prevention purposes.
- **VEGETATION-8:** White-stemmed clarkia plants within the project site will be flagged for avoidance. Construction crews will be educated regarding their presence and the appropriate avoidance measures to take for this species.
- **FISH-1:** The National Marine Fisheries Service (NMFS) shall be consulted to 1) develop appropriate avoidance and minimization measures, and 2) determine whether an Endangered Species Act Section 7 take permit will be required for the project. All protective measures imposed by NMFS through the consultation process shall be adhered to.
- **FISH-2:** Instream work can occur between July 1 and September 30. Instream work could start sooner if the California Department of Fish and Wildlife (CDFW) determines that the adult CV spring-run Chinook salmon are no longer present based on environmental conditions and real time passage data. Instream work could be extended to October 14, if environmental conditions which would preclude juvenile steelhead and spring-run Chinook salmon emigration or adult steelhead and late fall-run Chinook salmon immigration are expected to persist. Instream work outside of the July 1 to September 30 work window must be approved by CDFW and NMFS on a case-by-case basis with details on how take will be avoided and / or minimized.
- **FISH-3:** All construction debris (concrete, metal etc.) from the fish passage improvement-related construction activities will be removed from the active stream channel post-construction.
- **FISH-4:** Immediately prior to instream work, a qualified fish biologist, in coordination with CDFW, will conduct surveys above and below the area to be dewatered, to identify presence of salmonids. The Resource Conservation District of Tehama County (RCDTC), in coordination with the contractor, and in consultation with NMFS and CDFW, will ensure that qualified fish biologists are onsite to implement fish rescue operations within the dewatered area through the use of herding, seining and / or electrofishing, if necessary. Best professional determination will be used to decide which method(s) of rescue is to be used and where the relocation of captured fish, either upstream or downstream of the temporary dams is to occur. Biologists will first try to haze and herd fish out of the fish exclusion area. If fish biologists determine that the use of electrofishing is necessary for the efficient and successful removal of fish, NMFS electrofishing

guidelines (National Marine Fisheries Service 2000) will be strictly followed. The fish rescue team will be comprised of fishery biologists with professional experience using seines and electrofishing equipment. The same methodologies will be used during dewatering of the diversion ditches.

- **FISH-5:** All water pumps used during construction shall be screened to meet CDFW and NMFS criteria, unless deemed unnecessary by CDFW and NMFS (i.e. if water was being diverted from an off-channel pool). The refueling of pumps will occur away from the wetted area / channel. If pumps are using fuel, they will be outfitted with a spill kit.
- **FISH-6:** All dewatering and rewatering activities will be conducted slowly, in order to minimize disturbance to fish. A qualified fisheries biologist will be onsite during these activities, and CDFW will be notified prior to these activities.
- **FISH-7:** All reasonable measures will be taken to minimize impacts to lamprey, including spending more time at the area as it becomes dewatered (and they are moving out of the mud, chasing the water as it recedes), and possibly electroshocking.
- **FISH-8:** Appropriate measures will be used to avoid the spread of aquatic invasive species such as zebra / quagga mussels, New Zealand mudsnails and chytrid fungus to and from the project area according to the current CDFW Aquatic Invasive Species Disinfection / Decontamination Protocols (Northern Region) and the current U.S. Fish and Wildlife Service (USFWS) Red Bluff Fish and Wildlife Office Anadromous Fish Restoration Program Hazard Analysis Critical Control Point Plan.
- **WILDLIFE-1:** Within seven (7) calendar days prior to the onset of potentially disturbing construction activities, areas that will be disturbed within 100 feet of water bodies shall be surveyed by a qualified biologist to determine if any western pond turtles or turtle nests are present. If any turtles or turtle nests are found, a qualified and permitted biologist shall determine and implement appropriate relocation procedures, in coordination with California Department of Fish and Wildlife (CDFW). The site shall be checked daily by trained construction workers prior to work commencing, including underneath vehicles and equipment that will be used. If turtles are found, they will be moved by a qualified and permitted biologist to an area of safety out of harm's way.
- **WILDLIFE-2:** Within seven (7) calendar days prior to work in aquatic habitats, water bodies shall be surveyed by a qualified biologist to determine if any foothill yellow-legged frogs are present. If any foothill yellow-legged frogs are found, a qualified and permitted biologist shall determine and implement appropriate relocation procedures, in coordination with CDFW. The site shall be checked daily by trained construction workers prior to work commencing, including underneath vehicles and equipment that will be used. If foothill yellow-legged frogs are found, they will be moved by a qualified and permitted biologist to an area of safety out of harm's way.
- **WILDLIFE-3:** Any tree removal, vegetation clearing, or the onset of potentially disturbing construction activities shall occur between September 1 and January 1 (outside of the nesting season for raptors with potential to occur within, or in the vicinity of the project site). Note: Also see measure WILDLIFE-4.

  If tree removal, vegetation clearing, or the onset of potentially disturbing construction activities must occur during the nesting season, a raptor nesting survey of the construction area and adjacent suitable habitat shall be conducted by a qualified biologist no more than seven (7) calendar days prior to the initiation of the onset of these activities or as appropriate survey protocols require. If active raptor nests are found to be present, tree removal, vegetation clearing and the onset of potentially disturbing construction activities shall be suspended until a qualified biologist, in consultation with CDFW and / or USFWS can establish an appropriate protective buffer area to minimize impacts to the nesting raptors. No construction activities

shall commence within the buffer area until the qualified biologist determines that the young birds have fledged or the nest is no longer active.

Construction activities shall occur continuously (not including weekends) until the end of the nesting season to discourage raptors from initiating nesting. If construction activities cease for more than seven (7) consecutive days (including weekends), all construction activities shall cease until CDFW can be consulted to determine if a subsequent raptor nesting survey must be performed.

Active or inactive nests are not to be disturbed or removed as a result of construction activities without CDFW consultation per Fish and Game Code Section 3503.5.

- **WILDLIFE-4:** Any tree removal, vegetation clearing, or the onset of potentially disturbing construction activities shall occur between August 1 and March 1 (outside of the nesting season for grasshopper sparrow, yellow-breasted chat, loggerhead shrike, yellow warbler and other nesting migratory birds). Note: Also see measure WILDLIFE-3.

  If tree removal, vegetation clearing, or the onset of potentially disturbing construction activities must occur during the nesting season, a nesting survey of the construction area and adjacent suitable habitat shall be conducted by a qualified biologist no more than seven (7) calendar days prior to the initiation of the onset of these activities. If active bird nests are found to be present, tree removal, vegetation clearing and the onset of potentially disturbing construction activities shall be suspended until a qualified biologist, in consultation with CDFW, can establish an appropriate protective buffer area to minimize impacts to the nesting birds. No construction activities shall commence within the buffer area until the qualified biologist determines that the young birds have fledged or the nest is no longer active.

  Construction activities shall occur continuously (not including weekends) until the end of the nesting season to discourage avian species from initiating nesting. If construction activities cease for more than seven (7) consecutive days (including weekends), all construction activities shall cease until CDFW can be consulted to determine if a subsequent nesting bird survey must be performed.

  Active nests are not to be disturbed or removed as a result of construction activities per Fish and Game Code Section 3503.

- **WILDLIFE-5:** Prior to the onset of potentially disturbing construction activities during the nesting season, a Swainson's hawk nesting survey of the construction area and adjacent suitable habitat shall be conducted by a qualified biologist in accordance with the protocols in *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee 2000). If active Swainson's hawk nests are found to be present, the onset of potentially disturbing construction activities shall be suspended until a qualified biologist, in consultation with CDFW, can establish an appropriate protective buffer area to minimize impacts to the nesting birds. No construction activities shall commence within the buffer area until the qualified biologist determines that the nest is no longer active.
- **WILDLIFE-6:** Prior to any vegetation removal, an attempt will be made by a qualified biologist to determine if pallid bats, Townsend's big-eared bats or western red bats are roosting in the area to be removed / disturbed.

  If pallid bats, Townsend's big-eared bats or western red bats are found to be roosting within the area to be removed / disturbed, these activities shall be suspended until a qualified biologist, in consultation with CDFW, can establish appropriate measures to minimize impacts to these species.

- **WILDLIFE-7:** To the extent possible, all direct disturbance to identified bat roosts shall occur between August 31 and May 1, in order to minimize the likelihood of injuring or killing juvenile bats during the period when they are still unable to fly.

- **WILDLIFE-8:** To the extent possible, the removal of trees or branches with defects (cavities, cracks, exfoliating bark, etc.) that provide potential bat roosting or bird roosting / nesting habitat will be avoided.
- **WILDLIFE-9:** As appropriate, revegetation efforts will incorporate tree and vine species that are known to be used by western red bats for roosting including, but not limited to white alder *(Alnus rhombifolia)*, California sycamore *(Platanus racemosa)*, pipevine *(Aristolochia californica*) and California grape *(Vitis californica)*.
- **WILDLIFE-10:** Prior to the onset of construction activities, a construction worker education program shall be implemented that includes an explanation of all special-status animal species, identification, avoidance measures, and federal and state laws that protect the species. This shall include, at a minimum, those species described in the environmental documents.
- **WILDLIFE-11:** Prior to the onset of construction activities, a qualified biologist will inspect the project site for signs of denning by ringtails.

  If ringtails are found to be denning, construction activities will be suspended until a qualified biologist, in consultation with CDFW, can establish appropriate measures to protect ringtail.
- **WILDLIFE-12:** The project shall comply with the current Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*) (U.S. Fish and Wildlife Service 2017).
- **WILDLIFE-13:** The USFWS shall be consulted to 1) develop appropriate avoidance and minimization measures, and 2) determine whether an Endangered Species Act Section 7 take permit will be required for the project. All protective measures imposed by USFWS through the consultation shall be adhered to.
- **WILDLIFE-14:** Prior to construction, all elderberry shrubs to be avoided within 150 feet of any project activity will be clearly flagged, marked and maintained throughout construction in order to avoid impacts to the valley elderberry longhorn beetle. All elderberry shrubs to be avoided within 100 feet of project activity will be marked with high-visibility orange fencing.
- **WILDLIFE-15:** Signs will be installed every 50 feet, on the fencing of all elderberry shrubs within 100 feet of any project related activities with the following information: "This area is habitat for the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." Signs will be clearly readable from a distance of 20 feet and will be maintained for the duration of construction.
- **WILDLIFE-16:** Prior to construction, elderberry shrubs which cannot be avoided by project related activities with one or more stems measuring 1.0 inch or greater in diameter at ground level shall be transplanted onsite.

  A qualified biologist (monitor) must be onsite for the duration of the transplanting of the elderberry plants to insure that no unauthorized take of the valley elderberry longhorn beetle occurs. If unauthorized take occurs, the monitor must have the authority to stop work until corrective measures have been completed and must immediately report any unauthorized take of the beetle or its habitat to the USFWS and to CDFW.

  Elderberry shrubs will be transplanted during dormancy, from November 1 through the first two weeks of February, after the shrubs have lost their leaves, following the specific transplanting guidance provided in the *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus)* (U.S. Fish and Wildlife Service 2017).
- **WILDLIFE-17:** A qualified biologist (biological monitor) shall regularly inspect construction-related activities to ensure that no unnecessary disturbance to special-status species and / or their associated habitats occurs. The biological monitor shall have the authority to stop all

activities that may result in such disturbance until appropriate corrective measures have been completed. The biologist will also be required to report any unauthorized take to CDFW, USFWS and / or NMFS immediately.

- **WILDLIFE-18:** All food-related trash will be disposed of in closed containers and removed from the project area daily during the construction period. Construction personnel will not feed or otherwise attract wildlife to the project area.
- **WILDLIFE-19:** No pets will be allowed within the project area.
- **WETLAND-1:** Project activities will avoid impacts to wetlands and other aquatic habitats to the extent possible.
- **WETLAND-2:** High-visibility fencing will be installed in areas where equipment will be working near any wetlands and / or riparian habitat that are not to be disturbed.
- **WETLAND-3:** Construction crews will be informed about the importance of avoiding sensitive areas, including wetlands.
- **WETLAND-4:** A Clean Water Act Section 404 Permit will be obtained from the U.S. Army Corps of Engineers and a Clean Water Act Section 401 Certification will be obtained from the Central Valley Regional Water Quality Control Board (RWQCB).
- **WETLAND-5:** A California Fish and Game Code Section 1600 Lake or Streambed Alteration Agreement will be obtained from CDFW.
- **CULTURAL-1:** Cultural resource site EAD-CR-1 shall be considered environmentally sensitive and no use or modification of the site shall occur. Prior to the onset of construction, the boundary of the site shall be marked with high-visibility fencing and / or flagging and the need to avoid disturbance of the site shall be included in the environmental awareness training for project personnel.
- **CULTURAL-2:** Cultural resource site EAD-CR-2 shall be considered environmentally sensitive and no use or modification of the site shall occur. Use and modification of the existing roadbed adjacent to the site may occur but shall be confined to the existing road footprint not to extend more than 15 feet on either side of the existing road centerline. Prior to the onset of construction, the 15 foot buffer shall be marked with high-visibility fencing and / or flagging and the need to avoid disturbance of the site shall be included in the environmental awareness training for project personnel.
- **CULTURAL-3:** In the event subsurface archaeological resources are encountered during ground-disturbing activities, all work will cease at the general area of discovery and the USFWS regional archaeologist, or other lead agency archaeologist, will be notified immediately. A field exam by a professional archaeologist may be required and further steps for resource protection will be implemented, including mitigation and consultation with the Native American Indian community if human remains are encountered (following Native American Graves Protection and Repatriation Act procedures). Work may proceed on other parts of the project site while mitigation for historical, unique archaeological or tribal resources is being carried out.
- **HAZ-1:** A designated concrete washout area will be located at least 100 feet from any high water mark within adjacent waterways, and from any wetlands and will be developed and used following the U.S. Environmental Protection Agency Storm Water BMP for a Concrete Washout.
- **HAZ-2:** BMPs will be developed and implemented to ensure that wet concrete and concrete grindings do not enter Antelope Creek, New Creek, wetlands or other aquatic sites during construction.
- **HAZ-3:** Measures WATER-3 through WATER-5 associated with potential petroleum product spills will be fully implemented.
- **HAZ-4:** Construction equipment and materials shall not be stored or stockpiled in the creek channel, and shall be stored at least 50 feet from the top of the stream bank, any wetlands or other aquatic sites.

- **WATER-1:** All instream construction shall be conducted in the summer / early fall during the low flow period (see measure FISH-2). Any work within the channel and banks, outside of this instream work window must be isolated from flowing water and dewatering will be required.
- **WATER-2:** Monitoring of water turbidity and settleable materials shall be conducted in accordance with the Clean Water Act Section 401 Certification through consultation with RWQCB.
- **WATER-3:** All equipment and machinery that contains fuel, oil or other petroleum products used during construction related activities shall be checked for petroleum leaks immediately prior to being mobilized to the project site and again each day prior to use.
- **WATER-4:** All equipment refueling and / or maintenance shall take place within a secondary containment structure and a minimum of 100 feet away from Antelope Creek, New Creek, any wetlands or other aquatic sites.
- **WATER-5:** An emergency spill kit and absorbent oil booms will be onsite during construction activities.
- **WATER-6:** A dewatering permit will be obtained from the RWQCB, if deemed necessary based on the dewatering methods used.
- **WATER-7:** All equipment operations within the channel and banks of Antelope Creek and New Creek will be required to use readily biodegradable hydraulic oil.
- **SOIL / GEO / MIN-1:** After ground-disturbing activities are complete, all disturbed areas (outside of the active stream channels and the ditch bottoms) shall be seeded with native plant species and mulched as approved by the landowner and described in the revegetation plan and the Storm Water Pollutions Prevention Plan (SWPPP), if required.
- **SOIL / GEO / MIN-2:** Construction of all project actions shall comply with the RWQCB Basin Plan Objectives and an erosion control plan. Standard Best Management Practices (BMPs) will be incorporated into the project designs and / or the SWPPP, if required.
- **SOIL / GEO / MIN-3:** If the total disturbance area is greater than one acre, a Notice of Intent will be submitted to the State Water Resources Control Board to obtain coverage under the National Pollution Discharge Elimination System General Permit for Discharges of Storm Water Associated with Construction Activity.
- **WF-1:** All designated parking areas shall be kept free of dry vegetation before and during construction. Before construction begins, signage shall be installed at the entrance to the project site that prohibits parking outside of designed parking areas. Where heavy equipment or generators are used, fire extinguishers shall be made available on, or nearby the equipment.

Alternatives Considered but Dismissed

The following additional alternatives were developed in the *Preliminary Concept Report for the Antelope Creek Juvenile Fish Passage Improvement Project* (Vestra Resources and Resource Conservation District of Tehama County 2011). These alternatives were considered by the TAC but were dismissed due to the following reasons.

New Screens in Front of the Diversion Headgates

This alternative consisted of removing the existing fish screens in each ditch and replacing them with cone screens. The screens would be located in front of each ditches headgate. This alternative was rejected because of the potential damage which could occur to the screens during high flows, potential negative impacts to the floodplain, an increased requirement for maintenance, concerns over sedimentation and the extensive effort which would be required to remove the screens each season with a boom.

Siphon Bypass under New Creek

This alternative consisted of constructing an inverted siphon bypass return pipe from the Edwards Ditch fish screen, under New Creek and connect it into a LMMWC Ditch fish screen bypass return pipe which flows into Antelope Creek downstream of the EDD. This alternative was rejected due to the fact that it was technically unfeasible and also due to the fact that it did not meet NMFS fish screen criteria.

Crossing through New Creek

This alternative consisted of constructing a bypass return pipe from the Edwards fish screen, over New Creek and connecting it into a LMMWC Ditch fish screen bypass return pipe which would flow into Antelope Creek downstream of the EDD. The bypass pipe would be elevated above ground at a slope necessary to convey flow by means of gravity and have detachable sections for removal during high flow conditions or when not in use. In this alternative the LMMWC Ditch fish screen would be reversed allowing for the bypass pipe to exit on the Antelope Creek side of the structure. This alternative was rejected due to the potential for damage to the pipe during high flows, the extensive effort which would be required to remove the pipe sections each season during the winter months and the required removal of elderberry shrubs.

Combine the Diversions (Original Version)

This alternative consisted of combining both diversions at the LMMWC Ditch headgate, installation of a new headgate at the LMMWC Ditch, enlargement of the LMMWC Ditch between the headgate and the fish screen, installation of a flow spilt structure (with fish screen structure or a separate structure), installation of an inverted siphon from the LMMWC Ditch, under New Creek and into the Edwards Ditch, abandonment of the Edwards Ditch headgate and the filling of a portion of the canal to prevent a connection to Antelope Creek. The portion of the canal between the diversion and the inverted siphon would be abandoned or left in place. The Edwards fish screen would also be left in place or abandoned. This alternative was further revised to include bypass return pipes on each fish screen to bypass entrained fish into both Antelope Creek and New Creek. This alternative was rejected due to the limitations of only 25 cubic feet per second (cfs) for the Edwards diversion (less than the permitted water right) and a conflict with California Fish and Game Code regarding the proposed movement of fish from Antelope Creek to New Creek using the Edwards Ditch fish bypass system.

Los Molinos Mutual Water Company Ditch Bypass Pipe Only

This alternative consisted of constructing a bypass return pipe in only the LMMWC Ditch, from the fish screen to Antelope Creek. This alternative was rejected due to the fact that it did not fully address the issues at the project site and any future solutions which were to address the entire range of issues at the project site would likely require removal of some the components of this alternative.

3.0 Affected Environment and Environmental Consequences

This section contains background information and descriptions of the natural and cultural resources found in the project area that could be affected by the Proposed Action and the No Action alternative. This is followed by a description of the methods used to determine the environmental impacts to the affected environment for each resource type. An analysis is then provided of the environmental impacts that can be expected to the affected environment for each resource type under the two alternatives discussed in this document. The analyses of anticipated environmental impacts include those required by both CEQA and NEPA. Mitigation measures that would reduce significant impacts to less than significant levels are listed, if applicable. California law requires lead agencies under CEQA to adopt a Mitigation Monitoring and Reporting Program (MMRP). Environmental commitments in conjunction with any mitigation measures needed as conditions of project approval would be included in a MMRP to verify compliance.

3.1 Aesthetics

3.1.1 Affected Environment

Antelope Creek flows southwest out of the mountainous headwater regions in the southern Cascades in Tehama County to its confluence with the Sacramento River. The project area is located approximately one mile downstream of the mouth of the Antelope Creek canyon and is within the basin region of the creek. Elevations within this region range from 250 feet to 1,000 feet above mean sea level. Antelope Creek is not classified as wild and scenic. The aesthetic quality of the Antelope Creek watershed upstream of the project site is very high, however the project area has been developed for an agricultural water diversion system and ranching / farming operations such that the aesthetic quality is somewhat diminished, relative to the undeveloped upstream reaches. The area is characterized by a shallow perennial creek surrounded by a farmed and grazed foothill upland landscape. The property on which the project site is located includes a 1,258 square-foot domestic residence, another caretaker's residence and several outbuildings.

Antelope Creek is not considered a potential addition to the California Wild and Scenic Rivers System nor as a Study River (National Wild and Scenic Rivers System 2017), however Antelope Creek was considered a candidate Wild and Scenic River and recommended for inclusion into the program in the early 1990's (U.S. Forest Service 1992). The study segments considered for inclusion included seven miles of Antelope Creek's North Fork and seven miles on the South Fork (U.S. Forest Service 1992). Both sections are located over 22 miles upstream of the project area. There are no state designated scenic highways or eligible state scenic highways within, or near the project area (California Department of Transportation 2017). There are no state recognized scenic vistas in, or near the project area.

The project site has relatively high aesthetic values due to its remote nature. Farther downstream, between the project site and the Sacramento River, aesthetic conditions of the general area are lower. Aesthetic conditions, in particular scenic resources of the creek decrease lower in the watershed, closer to the Sacramento River as warmer water temperatures, urban features and impounded waters, which result in reduced instream flows, are encountered.

3.1.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

An aesthetic resource impact analysis in the project area was based on document review, site analysis and the CEQA significance criteria. Significance thresholds are used to evaluate the proposed project's potential impact on the visual character of the project area.

The project would have a significant impact if it would:

a) Have a substantial adverse effect on a scenic vista;
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality; or
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

No Action Alternative

Under this alternative, no impacts to the visual character of the project area would occur. No changes would occur to the character of the aesthetic features and existing land uses. The existing upstream visual characteristics related to the presence of the existing diversion infrastructure would remain.

Proposed Action Alternative

Under this alternative, any direct impacts to aesthetics would be considered short-term and minor in intensity. Any impacts to the aesthetics in the area would also only affect the landowner, a project proponent, who owns the parcel on which the project would be located and all of the large adjacent parcels. The project is located on private land and not included in a National Wild and Scenic Rivers System management plan, nor is it located within a state scenic highway or scenic vista.

The relatively isolated nature, topography and vegetation of the project area helps shield temporary visual construction impacts of any public views. The proposed project construction would have a short-term impact on the visual characteristics at the project site and the overall visual environment. The general aesthetic nature of the site would not be altered. No new light sources would result from the proposed project. The impacts of project implementation on aesthetic resources would therefore be less than significant.

3.2 Agricultural Resources

3.2.1 Affected Environment

The project site is located in a valley and foothill setting in Tehama County. The county is characterized as agricultural, where agriculture has historically been, and will continue to be a major economic base. In addition, the agricultural community is responsible for much of the area's rural character. The preservation of agricultural resources is identified as an objective in the County's general plan. Much of the unincorporated land in Tehama County is agricultural land used for livestock production. Tehama County participates in the Williamson Act and has established agricultural preserves to encourage long-term agricultural production.

The project site is privately owned by the Edwards Ranch. The property where the project would be located is enrolled in the Williamson Act as Non-prime Agricultural Land (California Department of Conservation 2017). The Tehama County General Plan designations within the project site include Upland Agricultural and Valley Floor Agriculture. The Tehama County zoning designations within the project site include Agricultural / Upland District and Agricultural / Valley District. A search of the Farmlands Mapping and Monitoring Program of the California Department of Conservation (California Department of Conservation 2019a) found no Prime Farmland, Unique Farmland, or Farmland of Statewide Importance within the project site, however the lands irrigated by the EDD diversions include Prime Farmland, Unique Farmland, and / or Farmland of Statewide Importance.

Agricultural uses in the general area include limited livestock grazing with dryland pasture and irrigated lands cultivated for hay. Diversions serve the Edwards Ranch and other various agricultural users which are customers of the LMMWC. Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance and Grazing Land are present near the project site (California Department of Conservation 2019a). Water from the existing diversions infrastructure is used by the Edwards Ranch and LMMWC customers for irrigation and livestock water.

Six different soil map units occur within the project area according to the local soil survey (Soil Conservation Service et al. 1967). The soils mapped within the project sites include the following map units (Table 2).

Table 2. Land Capability Classifications

Soil	Land Capability Classification	Capability Classification Description
Vina loam, 0 to 3 percent slopes (VnA)	I-1	Soils have few limitations that restrict their use. Soil has an erosion hazard, actual or potential.
Molinos fine sandy loam, moderately deep over clay (Mz)	IIIs-3	Soils have severe limitations that reduce the choice of plants or require special conservation practices, or both. Soil is limited mainly because it is shallow, droughty, or stony. Soil has a problem or limitation of slow permeability of the subsoil.
Tuscan cobbly loam, moderately deep, 1 to 5 percent slopes (TvB)	IVs-8	Soils have very severe limitations that restrict the choice of plants, require very careful management, or both. Soil is limited mainly because it is shallow, droughty, or stony. Soil has a problem or limitation caused by shallow depth of soil over bedrock.
Molinos complex, channeled (Mzt)	VIw-1	Soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife. Water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage). Soil has an erosion hazard, actual or potential.
Tuscan cobbly loam, 1 to 5 percent slopes (TuB)	VIIs-8	Soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to grazing, woodland, or wildlife. Soil is limited mainly because it is shallow, droughty, or stony. Soil has a problem or limitation caused by shallow depth of soil over bedrock.
Riverwash (Rr)	VIIIw-4	Soils and landforms have limitations that preclude their use to recreation, wildlife, or water supply, or to esthetic purposes. Water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage). Soil has a problem or limitation caused by coarse soil texture or excessive gravel.

3.2.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

The methodology used for an agricultural related analysis involved an assessment of the agricultural resources, production capabilities and current agricultural uses of the project site and surrounding area. The analysis was conducted through document review and site visits.

Impacts to Agriculture Resources would be significant if they would:

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the

California Resources Agency, to non-agricultural use;

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract;
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g));
d) Result in the loss of forest land or conversion of forest land to non-forest use; or
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use.

No Action Alternative

Under this alternative, no changes to agricultural resources would occur. No changes would occur to the existing diversion infrastructure at the EDD. Diversions for the LMMWC and Edwards Ranch would continue to be managed with rough visual estimates and benefits resulting from infrastructure improvements resulting in improved control and measurement of diversion flows would not occur.

Proposed Action Alternative

Under this alternative, the proposed project would not convert any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural uses. No Prime Farmland, Unique Farmland, or Farmland of Statewide Importance is located within the project boundary, however agricultural diversions at the EDD are used to irrigate Prime Farmland, Unique Farmland, and / or Farmland of Statewide Importance. The proposed project is limited to building the infrastructure that will allow the Edward Ranch, LMMWC and the various regulatory agencies the flexibility to operate the facility in a way that best meets the needs of the agricultural diverters and meets legal requirements. The operation of the facility with regard to the timing and amount of flows to meet fish passage requirements will be determined through a separate Fish and Game Code Section 1600 Stream or Lake Alteration Agreement between the Edwards Ranch and CDFW, and an Operations and Maintenance Agreement between the Edwards Ranch, LMMWC, CDFW, USFWS and NMFS. The proposed alternative would not conflict with any existing zoning for agricultural use, or a Williamson Act contract or involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use. The proposed project would not result in the loss of forest land or conversion of forest land to non-forest use or conflict with existing zoning, or cause rezoning of forest land, timberland or timberland zoned Timberland Production. Because the proposed project would not convert farmland to non-agricultural uses; convert forest land to non-forest uses; conflict with existing zoning for agricultural use or a Williamson Act contract; or conflict with existing zoning for, or cause rezoning of forest land, or timberland; there would be no impacts to agricultural resources.

3.3 Air Quality

3.3.1 Affected Environment

The project area climate is characterized by hot, dry summers and cool, wet winters. During the summer months from mid-April to mid-October, significant precipitation is unlikely and temperatures range from daily maximums exceeding 100° Fahrenheit (°F) to evening lows in the high 50s and low 60s. During the winter, highs are typically in the 60s with lows in the 30s. Wind direction is primarily along the valley due to the channeling effect of the mountains to either side of the Sacramento Valley. During the summer months, surface air movement is from the south, particularly during the afternoon hours. During the winter months, wind direction is more variable.

The 1977 federal Clean Air Act requires the U.S. Environmental Protection Agency (EPA) to identify National Ambient Air Quality Standards to protect public health and welfare. Similar to federal requirements, the

1988 California Clean Air Act outlines a program to attain the California Ambient Air Quality Standards. Tehama County is part of the Northern Sacramento Valley Air Basin (NSVAB), and is under the jurisdiction of the Tehama County Air Pollution Control District (TCAPCD). The California Air Resources Board (CARB), California's state air quality management agency, regulates mobile source emissions and oversees the activities of the TCAPCD.

Within Tehama County, the TCAPCD is responsible for adopting and enforcing controls on stationary sources of air pollutants through its permit and inspection programs. Other TCAPCD responsibilities include monitoring air quality, regulating agricultural burning, preparation of clean air plans and responding to air quality complaints from citizens. Based on 2018 CARB data, Tehama County is currently in attainment or unclassified status for all national criteria pollutant standards. 2017 CARB data shows that Tehama County is a nonattainment area for state standards for ozone and particulate matter less than 10 microns in diameter (PM_{10}).

Proximity to sensitive receptors is a concern in air quality analyses. A sensitive receptor is a location where human populations, particularly children, seniors, and sick individuals, are present and where there is a reasonable expectation of continuous human exposure to pollutants. Sensitive receptors could include locations such as schools, senior housing facilities, hospitals and / or residential buildings. The project is not located near a school, the closest school is located over three miles to the west of the project site. The project is also not located near a hospital (the closest hospital is located over five miles to the southwest) or near senior housing (the closest senior housing is located over four miles to the west). The project is located approximately 0.75 miles to the south of two residences associated with the Edwards Ranch, a member of the TAC and a project proponent.

3.3.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

Data for the impacts analysis were taken from 2017 and 2018 CARB data maps as well as discussions with the TCAPCD. The air quality analysis is qualitative, and was conducted by assessing anticipated construction-related impacts of the project and comparing them to existing and anticipated future air quality conditions.

The project would have a significant impact if it would:

a) Conflict with or obstruct implementation of the applicable air quality plan;

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard;

c) Expose sensitive receptors to substantial pollutant concentrations; or

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

No Action Alternative

Under this alternative, no construction activities would occur to the EDD diversion infrastructure. Because this alternative would not cause any direct short-term emissions, emissions would remain consistent with, and in conformity with applicable plans. Because no activities would occur, this alternative would not adversely affect any sensitive receptors and no long-term indirect impacts to air quality would occur.

Proposed Action Alternative

Under this alternative, construction would occur over in two phases during an approximately one year construction schedule with a four month idol period between phases. Types of construction equipment to be used would include front-end loaders, excavators, concrete mixer trucks, dump trucks and 4-inch water pumps.

Construction-related activities would generate criteria air pollutants, including carbon monoxide, sulfur dioxide, PM_{10}, precursors such as reactive organic gases and oxides of nitrogen, greenhouse gas (GHG) from exhaust and fugitive dust emissions. Sources of exhaust emissions include delivery trucks, commuting worker's motor vehicles and off-road heavy-duty equipment. Sources of fugitive dust emissions, such as particulate matter dust include construction-related activities such as soil disturbance, grading and material hauling. This is considered a potentially significant impact.

The project would involve the use of equipment and travel on unpaved roads to access the sites, which would temporarily contribute fugitive dust in the project area. This source of fugitive dust is associated with PM_{10}, a criteria pollutant, for which the Tehama air basin is in non-attainment. Construction activities associated with the project are expected to take approximately 50 total operation days. Once activities cease at the project area, the resulting impact on air quality and increase in GHG emissions would also cease. This is considered a potentially significant impact.

Construction associated with the proposed project would require the use of equipment that would temporarily contribute to air pollution in the local area but not affect an existing, or projected air quality violation. Exhaust emissions from heavy equipment during construction could contribute to air emissions. Construction activities would generate emissions from diesel- and gasoline-powered equipment and vehicles. Diesel particulate is an identified Hazardous Air Pollutant and Toxic Air Contaminant, emissions of which should be minimized. In addition, vehicles traveling to the site and construction activities would generate GHG emissions from diesel and gasoline-powered vehicles and equipment. This is considered a potentially significant impact. GHG emissions are further analyzed in Section 3.8 Greenhouse Gas Emissions.

The project is not anticipated to produce substantial pollutant concentrations which could affect surrounding land uses or sensitive receptors. Also the project will not produce any emission created nuisance odors for any substantial number of people in the immediate area. There are no sensitive receptors located near the project site.

The following measures would be implemented to avoid and minimize impacts to air quality and to mitigate potentially significant impacts listed above to less than significant levels:

AIR-1: <u>Standard Mitigation Measures for Construction Equipment</u>

i. Maintain all construction equipment in proper tune according to manufacturer's specifications.
ii. Maximize to the extent feasible, the use of diesel construction equipment meeting current CARB certification standards for off-road heavy-duty diesel engines.
iii. Registration in the CARB DOORS program (www.arb.ca.gov/msprog/ordiesel/ordiesel.htm) and meeting all applicable standards for replacement and/or retrofit.
iv. All portable equipment, including generators and air compressors rated over 50 brake horse power, registered in the Portable Equipment Registration Program (www.arb.ca.gov/portable/portable.htm), or permitted through the District as a stationary source.

<u>Discretionary Mitigation Measures for Construction Equipment</u>

i. Electrify equipment where feasible.
ii. Substitute gasoline-powered for diesel-powered equipment, where feasible.
iii. Use alternatively fueled construction equipment on site where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane, or biodiesel.
iv. Use equipment that has Caterpillar pre-chamber diesel engines

AIR-2: Fugitive Dust Permits shall be obtained from the Tehama County Air Pollution Control District (TCAPCD).

AIR-3: Land Clearing / Earth Moving and Compliant Signage: Water shall be applied by means of truck(s), hoses and/or sprinklers as needed prior to any land clearing or earth movement to minimize dust emission. Water shall be applied to disturbed areas a minimum of 2 times per day or more as necessary. Post a publicly visible sign with the telephone number and person to contact regarding dust complaints. This person shall respond and take corrective action within 24 hours. The telephone number of the District shall also be visible to ensure compliance with District Rule 4:1 & 4:24 (*Nuisance and Fugitive Dust Emissions*).

Visibly Dry Disturbed Soil Surface Areas, Unpaved Roads, and Gravel: All visibly dry disturbed soil surface areas of operation shall be treated with a dust palliative agent and/or watered to minimize dust emission. All visibly dry disturbed unpaved roads surface areas of operation shall be watered to minimize dust emission. Unpaved roads may be graveled to reduce dust emissions.

Paved Road Track-Out and Haul Vehicles: Existing roads and streets adjacent to the project will be cleaned at least once per day unless conditions warrant a greater frequency. Haul vehicles transporting soil into or out of the property shall be covered. Haul roads shall be sprayed down at the end of the work shift to form a thin crust. This application of water shall be in addition to the minimum rate of application.

Vehicles Entering/Exiting Construction Area and Employee Parking: Vehicles entering or exiting construction area shall travel at a speed which minimizes dust emissions. Construction workers shall park in designated parking areas(s) to help reduce dust emissions. On-site vehicles limited to a speed which minimizes dust emissions on unpaved roads.

Soil Piles: Soil pile surfaces shall be moistened if dust is being emitted from the pile(s). Adequately secured tarps, plastic or other material may be required to further reduce dust emissions.

3.4 Biological Resources

3.4.1 Vegetation and Plant Communities

3.4.2 Affected Environment

Vegetation in the study area was characterized by species composition and habitat association. Major plant communities include Ruderal Annual Grassland / Herbland, Mixed Riparian Woodland / Scrub and Emergent Wetland (Figure 14). General characteristics and species composition for each are as follows:

Ruderal Annual Grassland / Herbland

This plant community occurs along the disturbed margins of the access road, and along edges and in disturbed openings in the Mixed Riparian Wokodland/Scrub community. Depending on site this community best corresponds to the Annual Brome Grasslands Semi-Natural Herbaceous Stand (Sawyer et al. 2009). Non-native annual grasses observed include silver European hairgrass *(Aira caryophyllea)*, slender wild-oat *(Avena barbata)*, small rattlesnake grass *(Briza minor)*, soft chess *(Bromus hordeaceus)*, foxtail chess *(Bromus madritensis)*, ripgut *(Bromus diandrus)*, poverty brome *(Bromus sterilis)*, hedgehog dogtail *(Cynosurus echinatus)*, Italian rye *(Festuca perennis)*, and rattail fescue *(Festuca myuros)*. Non-native forbs observed include yellow star-thistle *(Centaurea solstitialis)*, filaree *(Erodium cicutarium, Erodium moschatum)*, smooth

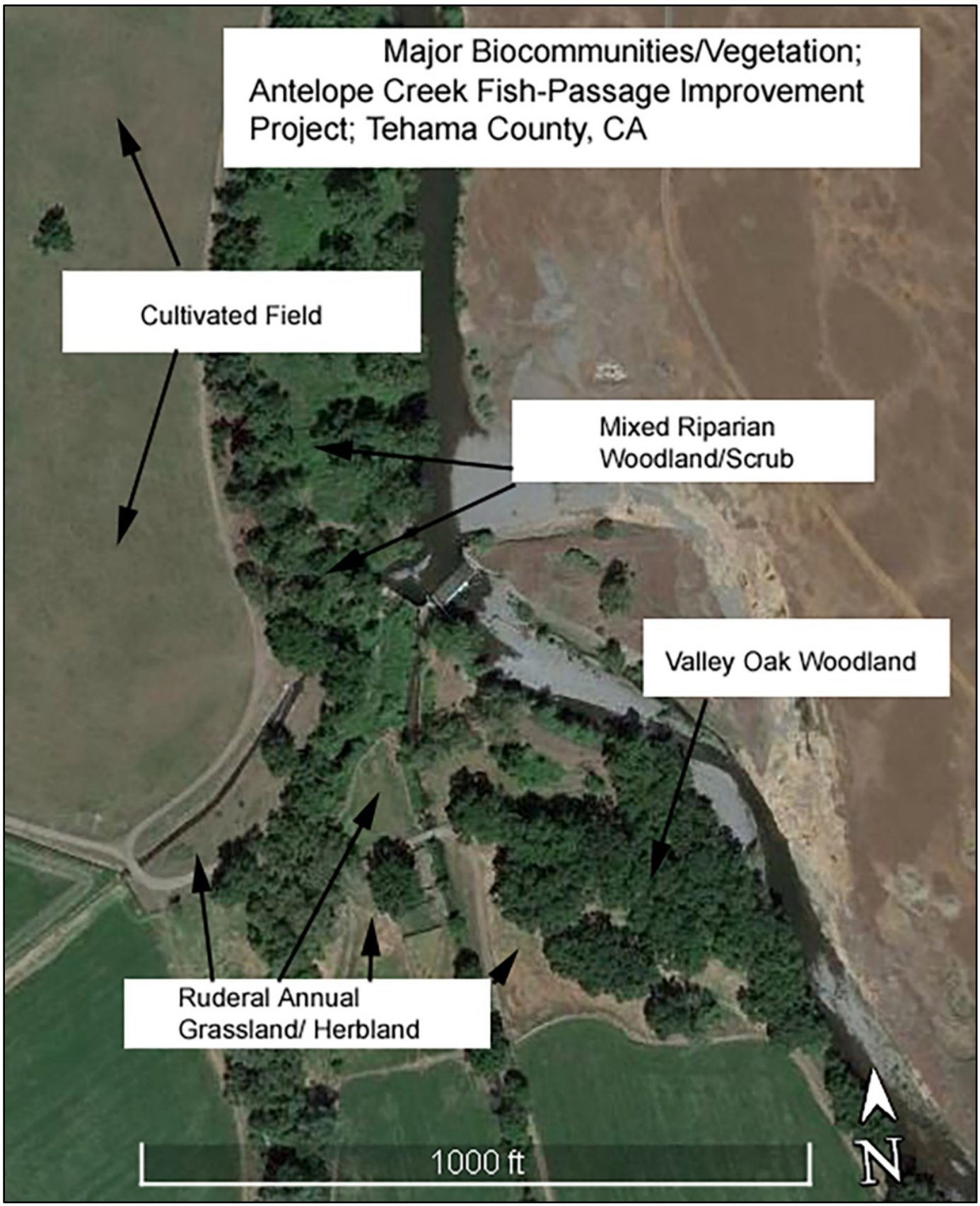


Figure 14. Major Biocommunities and Vegetation Types

cat's-ear *(Hypochaeris glabra)*, bur clover *(Medicago polymorpha)*, grasspink *(Petrorhagia dubia)*, hop clover *(Trifolium dubium)*, rose clover *(Trifolium hirtum)*, sessile-headed clover *(Trifolium glomeratum)*, Italian hoary-mustard *(Hirschfeldia incana)*, dove's-foot geranium *(Geranium molle)*, smartweed *(Polygonum aviculare)*, ruby sandspurrey *(Spergularia rubra)* and others.

Mixed Riparian Woodland / Scrub

This woodland type is associated with the banks and floodplain of Antelope Creek and New Creek. Composition varies by location. Depending on site, vegetation corresponds either to the California Sycamore Woodlands Alliance or the Valley Oak Woodland Alliance (Sawyer et al. 2009). Where the canopy is open and larger trees are lacking, vegetation corresponds to the Arroyo Willow Thickets Shrubland Alliance and Sandbar Willow Thickets Shrubland Alliance (Sawyer et al. 2009). In addition to California sycamore *(Platanus racemosa)* and valley oak *(Quercus lobata)*, other tree species observed include white alder *(Alnus rhombifolia)*, Oregon ash *(Fraxinus latifolia)*, a few scattered Fremont cottonwood *(Populus fremontii)*, black walnut *(Juglans hindsii / nigra)* and edible fig *(Ficus carica)*. Shrubs and subshrubs include sandbar willow *(Salix exigua)*, arroyo willow *(Salix lasiolepis)*, blue elderberry *(Sambucus nigra ssp. caerulea)*, California rose *(Rosa californica)*, western spicebush *(Calycanthus occidentalis)*, buttonwillow *(Cephalanthus occidentalis)*, Himalayan blackberry *(Rubus armeniacus)*, California blackberry *(Rubus ursinus)* and poison oak *(Toxicodendron diversilobum)*. Two buckbrush shrubs *(Ceanothus cuneatus)* were seen near the EDD. Vines include California grape *(Vitis californica)*, California manroot *(Marah californica)* and California pipevine *(Aristolochia californica)*.

In drier sites, the herbaceous component of the understory shares species in common with Ruderal Annual Grassland / Herbland comminity. Additional non-native forb species encountered in the understory include bur-chervil *(Anthriscus cauculis)*, hedge parsley *(Torilis arvensis)*, cleavers *(Galium aperine)*, wall bedstraw *(Galium parisiense)*, chickweed *(Stellaria media / pallida)*, subterranean clover *(Trifolium subterraneum)*, sherardia *(Sherardia arvensis)*, garden vetch *(Vicia sativa)*, hedge-vustard *(Sisymbrium officinale)*, horehound *(Marrubium vulgare)* and others. Native forb species include small-flowered miner's lettuce *(Claytonia parviflora)*, common miner's lettuce *(Claytonia perfoliata)*, purple clarkia *(Clarkia purpurea)*, Pacific sanicle *(Sanicula crassicaulis)*, small Venus' looking-glass *(Triodanis biflora)* and a few others. Plants associated with moister sites include natives such as hoary stream-nettle *(Urtica dioica ssp. holosericea)*, mugwort *(Artemisia douglasiana)*, toadrush *(Juncus bufonius)*, cocklebur *(Xanthium strumarium)*, Canadian horseweed *(Erigeron canadensis)*, western goldenrod *(Euthamia occidentalis)*, white sweet-clover *(Melilotus albus)*, marsh cudweed *(Gnaphalium palustre)*, redmaids *(Calandrinia ciliata)*, Spanish lotus *(Acmispon americanus var. americanus)*, northern willowherb *(Epilobium ciliatum)*, bird's-foot trefoil *(Lotus corniculatus)*, sticktight *(Bidens frondosa),* common monkey-flower *(Mimulus gutattus)* and others. Grasses in these moister sites include rice cutgrass *(Leersia oryzoides)*, dallisgrass *(Paspalum dilatatum)*, johnsongrass *(Sorghum halapense)* and beardgrass *(Polypogon monspeliensis)*. Grass-like plants include scattered Pacific rush *(Juncus effusus)*, torrent sedge *(Carax nudata)* and umbrella sedge *(Cyperus eragrostis)*.

Emergent Wetland

Small areas of this community are associated with the immediate banks and beds of Antelope Creek, New Creek and the two ditches. Depending on site, this vegetation best corresponds to the Torrent Sedge Patches Herbaceous Alliance (Sawyer et al. 2009). In addition to torrent sedge *(Carex nudata)*, and some species mentioned under the Mixed Riparian Woodland / Scrub comminity, others include yellow waterweed *(Ludwigia peploides ssp. peploides)*, and several pre-flowering species including pondweed *(Potamogeton sp.)*, smartweed *(Polygonum sp.)* and water plantain *(Alisma triviale)*.

3.4.3 Environmental Consequences / Impacts and Mitigation Measures

Methodology

The assessment of potential impacts of the proposed project on vegetation and plant communities is based on a review of databases and pertinent literature, consultation with resource agency staff, and field studies that are documented in a *Survey for Special-status Vascular Plant Species* (Dittes and Guardino Consulting 2016) that was prepared for the proposed project. This document is available on the RCDTC website (http://www.tehamacountyrcd.org) and the Red Bluff Fish and Wildlife Office website on the AFRP webpage (http://www.fws.gov/redbluff/afrp.html).

A preliminary investigation was performed that included a query of The California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (California Native Plant Society 2016) for Tehama County. The California Natural Diversity Database (CNDDB) (California Department of Fish and Wildlife 2016) was also queried for special-status plant species from the Red Bluff East, and surrounding eight USGS 7.5-minute quadrangles (Bend, Dales, Tuscan Springs, Los Molinos, Gerber, West of Gerber, Red Bluff West and Hooker). In addition, the Consortium of California Herbaria was queried for special-status species recorded from the vicinity but not included in the CNDDB (http://ucjeps.berkeley.edu/consortium/). The results of these database queries were used, along with consideration of site location and habitat (including parent material / soils), to compile a list of vascular plant species with potential to occur in the study area (Appendix B).

The field survey was conducted by John Dittes on May 18, 2016. The survey was performed with the aid of a map with project study area boundary on an aerial photo-base. An intuitive-controlled survey was performed within the study area. All areas subject to potential disturbance were assessed, along with a minimal 30-foot buffer. This included the project construction footprint, staging area, the approximate 0.8-mile reach of graded dirt road extending between the ranch headquarters and the EDD.

All plant species encountered were identified to the taxonomic level necessary to determine legal status and scientific significance. Plants not readily identified in the field were identified later in the lab. Scientific names follow Baldwin et al. (2012); common names follow Janeway (2013). Plant species encountered during the field surveys are listed in Appendix C.

No special-status vascular plant species have been previously documented from within the study area as indicated by the database queries. Timing of the 2016 field surveys was such that all potentially occurring species included in the database queries would have been identifiable at least to the level of genus, if present. During these surveys, no plant species were encountered that were not identifiable to the level necessary to make a determination of significance.

The 2016 field survey revealed the presence of a few individuals of two special-status vascular plant species within the study area, shield-bracted monkey-flower (*Erythranthe glaucescens*, CNPS Rank 4.3) and white-stemmed clarkia (*Clarkia gracilis ssp albicaulis*, CNPS Rank 1B.2). No federal or state listed plant species were encountered in the surveyed study area and suitable habitat for them is lacking (Dittes and Guardino Consulting 2016).

<u>Shield-bracted Monkey-flower</u>

Shield-bracted monkey-flower was encountered at two sites within the study area. One plant was found growing in a crack in the concrete-lined Edwards Ditch. The other plant was seen on the immediate bank of Antelope Creek just upstream from the EDD. This species is known from Shasta, Tehama, Butte, Colusa, Lake and Nevada Counties. It occurs on 32 USGS 7.5-minute quadrangles. Shield-bracted monkey-flower is locally frequent and often abundant along drainages and on seeps associated with the Tuscan Volcanic Formation between Table Mountain in Butte County and Battle Creek in Shasta County. This species has been assigned a CNPS Rank of 4.3, meaning it is uncommon but not very endangered in California. It has been assigned a State Rank of S3 and a Global Rank of G3, meaning it is “Vulnerable”. Numerous occurrences are encompassed

within lands held in Conservation Easement with TNC in their Lassen Foothills Project Area (J. Dittes, pers. obs.). CNPS does not list the number of occurrences for this taxon.

White-stemmed Clarkia

White-stemmed clarkia was encountered at one site within the study area. A single plant was observed on the western bank of Antelope Creek, growing in moist soil in littoral wetland vegetation at the disturbed edge of a graded dirt access road, just upstream from the EDD (see Figure 14). The survey was complete and appropriately-timed. Two other clarkia species were also encountered including purple clarkia and red ribbons *(Clarkia* concinna *ssp. concinna)*. Purple clarkia is comparatively frequent in the study area. Red ribbons and white-stemmed clarkia, in contrast, were both represented by single plants, situated near each other on the active creek floodplain. Post-flowering individuals of purple clarkia were observed along with flowering individuals. There were no pre-flowering clarkia observed, nor any post-flowering clarkia with fruit resembling white-stemmed clarkia or red ribbons.

White-stemmed clarkia is a California-endemic known from Butte, Lake and Tehama Counties. It is currently reported from 31 occurrences on 12 USGS 7.5-minue quadrangles. White-stemmed clarkia is an upland species that is sometimes associated with serpentinite soils. CNDDB lists it as growing in chaparral and cismontane woodlands, between approximately 195 and 4,065 feet in elevation. This species has been assigned a CNPS Rank of 1B.2, meaning it is fairly endangered in California. It has been assigned a State Rank of S2 and a Global Rank of G2, meaning it is "Imperiled". The nearest documented CNDDB occurrence is situated approximately 13.5 miles east by southeast, in the Dye Creek watershed, at an elevation of approximately 1,550 feet. The next nearest-known CNDBB occurrence is located in the Mill Creek watershed, at an elevation of approximately 3,360 feet, approximately 23 miles to the east of this individual plant. There are no documented CNDDB occurrences in the Antelope Creek watershed.

The white-stemmed clarkia plant at this location may be a "transient waif", established from seed transported by Antelope Creek from higher elevations in the watershed. Two main considerations supporting the suggestion of it being "waif" are presence of only one plant during the 2016 growing season and atypical habitat and plant-community association. This plant is on the active floodplain of Antelope Creek, near the high waterline, on disturbed soil among highly competitive herbaceous wetland species. The immediately-surrounding plant community is mixed riparian woodland / scrub with a mostly non-native annual grassland understory. White-stemmed clarkia is an upland species with all documented occurrences being associated with upland chaparral and cismontane woodland communities. If this plant is at the edge of a larger population, the larger population would necessarily be associated with littoral wetland, riparian woodland / scrub, valley annual grassland or agricultural hay fields. There are no known white-stemmed clarkia occurrences documented from those communities / habitats. Conversely, it is not uncommon for foothill and montane plant species to be found as scattered individuals in the northern Sacramento Valley, well below their typical elevations, outside of their typical habitats, within the high water mark of streams. Some plant collectors suggest excluding "gravel bar waifs" from herbaria collections since they do not represent locations, elevations or habitat associations of established, self-perpetuating populations. Conversely, it is possible that the plant observed is part of an established, self-perpetuating population.

Invasive Species

Invasive species encountered in the study area include yellow star-thistle, puncture-vine *(Tribulus terrestris)*, milk-thistle *(Silybum marianum)*, Klamathweed *(Hypericum perforatum)*, Himalayan blackberry and edible fig. All of these species are well-established in the region. There are several other species which are spreading in the region but which were not observed in the study area, including, but not limited to goatgrasses *(Aegilops cylindrica, Aegilops triuncialis)*, stinkweed *(Dittrichia graveolens)* and Italian plumeless thistle *(Carduus pycnocephalus)*.

Sensitive Habitats

Several vegetative habitats that are generally considered sensitive, due to historic losses and their importance to rare plants and animals are present within the study area. These habitats include riparian, emergent wetland and valley oak woodland.

An impact related to Vegetation and Plant Communities would be significant if the project would:

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 CDFW, USFWS or NMFS;
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 CDFW or USFWS;
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plans.

The thresholds of significance listed above will be used to evaluate the potential for significant impacts on all of the remaining biological sections including Wildlife, Wetlands and Other Jurisdictional Waters of the U.S., and Fisheries.

No Action Alternative

Under this alternative, no project activities would occur, therefore no impacts would occur to special-status plant species or existing vegetation, and no additional exotic plant species would potentially become established at the site, over and above existing land uses.

Proposed Action Alternative

Under this alternative, the proposed project has potential to directly and indirectly impact populations of shield-bracted monkey-flower and white-stemmed clarkia.

Shield-bracted Monkey-flower

Under this alternative, the proposed project has potential to directly and indirectly impact populations of shield-bracted monkey-flower. Mitigation is generally not required for CNPS List 4 species unless the population in “unique” in some way (e.g., outside of known range, the type locality, morphologically / genetically unique, etc.). Loss of plants as a result of implementing this alternative would not likely affect the overall viability of this species given the overall distribution and its commonness and abundance along streams and on seeps in the region. For this reason, this is considered a less than significant impact.

White-stemmed Clarkia

Under this alternative, the proposed project has potential to directly and indirectly impact populations of white-stemmed clarkia. Mitigation is required for CNPS Rank 1.B species, since they are either listed as rare, threatened, or endangered under state or federal endangered species acts, or they are candidates for listing. As described above, the single white-stemmed clarkia plant is possibly a water-transported, transient “waif” which does not constitute a viable population requiring protection. It is possible however, that additional

plants have germinated and are growing at that location. For this reason, this is considered a potentially significant impact.

Invasive Species

Under this alternative, invasive species that do not currently occur at the project site could be brought in as seeds or plant tissues during the mobilization of construction equipment, which could allow them to colonize the site. This is considered a potentially significant impact.

Sensitive Habitats

Under this alternative, there would be direct and indirect impacts to riparian emergent wetland habitats. Because these habitat are generally considered sensitive, this is considered a potentially significant impact. Some of these impacts and measures to address them are discussed in Section 3.4.7 Wetlands and Other Jurisdictional Waters of the U.S. No impacts would occur to valley oak woodland habitat under this alternative.

A permanent loss of approximately 0.01 acres of vegetation, composed of a combination of riparian and upland vines such as California grape, Himalayan blackberry and elderberry would occur along the LMMWC Ditch as a result of widening and concrete-lining the ditch. Because of the small area involved, and the fact that all other vegetation impacts would be revegetated, the loss of this vegetation is considered a less than significant impact. Impacts to the valley elderberry longhorn beetle as a result of impacts to the elderberry shrubs will be discussed in Section 3.4.4 Wildlife.

The following measures would be implemented to avoid and minimize impacts to vegetation and plant communities and to mitigate potentially significant impacts listed above to vegetation and plant communities to less than significant levels:

VEGETATION-1: Disturbance to existing vegetation will be avoided or minimized to the extent possible.

VEGETATION-2: Disturbance to riparian vegetation will be avoided or minimized to the extent possible.

VEGETATION-3: All heavy equipment shall be thoroughly cleaned prior to mobilization onsite to remove any soil, weed seeds and plant parts to reduce the importation and spread of invasive exotic plant species.

VEGETATION-4: Only certified weed-free straw shall be used for erosion control or other purposes to reduce the importation and spread of invasive exotic plant species.

VEGETATION-5: A revegetation plan will be prepared in coordination with the landowner to replace impacted riparian wetlands and other woody vegetation by a measure of quantity and quality equal to, or exceeding impacts of the project using appropriate native riparian trees and shrubs.

VEGETATION-6: Road improvement and grading activities shall be conducted in such a manner that disturbances are confined to the already disturbed road prism.

VEGETATION-7: No smoking will be allowed on the construction site or within the project area, for fire prevention purposes.

VEGETATION-8: White-stemmed clarkia plants within the project site will be flagged for avoidance. Construction crews will be educated regarding their presence and the appropriate avoidance measures to take for this species.

3.4.4 Wildlife

3.4.5 Affected Environment

Five habitat types generally occur within the study area as defined by the California Wildlife-Habitat Relationships classification system (Mayer and Laudenslayer 1988). The habitat types include Annual

Grassland, Cropland, Riverine, Valley Foothill Riparian and Valley Oak Woodland, (Figure 15). The wildlife that potentially inhabit the area are those species that would normally be expected to use these habitats for food, shelter and cover within the general region (Sacramento valley and foothills).

3.4.6 Environmental Consequences / Impacts and Mitigation Measures

Methodology

The assessment of potential impacts of the proposed project on wildlife is based on a review of databases and pertinent literature, consultation with resource agency staff, and field studies that are documented in a *Biological Resources Evaluation* (Tehama Environmental Solutions 2017) that was prepared for the proposed project. This document is available on the RCDTC website (http://www.tehamacountyrcd.org) and the Red Bluff Fish and Wildlife Office website on the AFRP webpage (http://www.fws.gov/redbluff/afrp.html).

Prior to the initiation of field studies, a records search of the CNDDB (California Department of Fish and Wildlife 2016) was conducted to determine if any special-status animals, or rare natural communities had previously been documented within the study area, or in the vicinity of the study area. The query was conducted using the USGS Red Bluff East 7.5-minute quadrangle, in which the project is located, along with the eight adjoining quadrangles (Bend, Dales, Tuscan Springs, Los Molinos, Gerber, West of Gerber, Red Bluff West and Hooker). In addition, species lists for the study area were requested from USFWS (U.S. Fish and Wildlife Service 2019) and NMFS (National Marine Fisheries Service 2019).

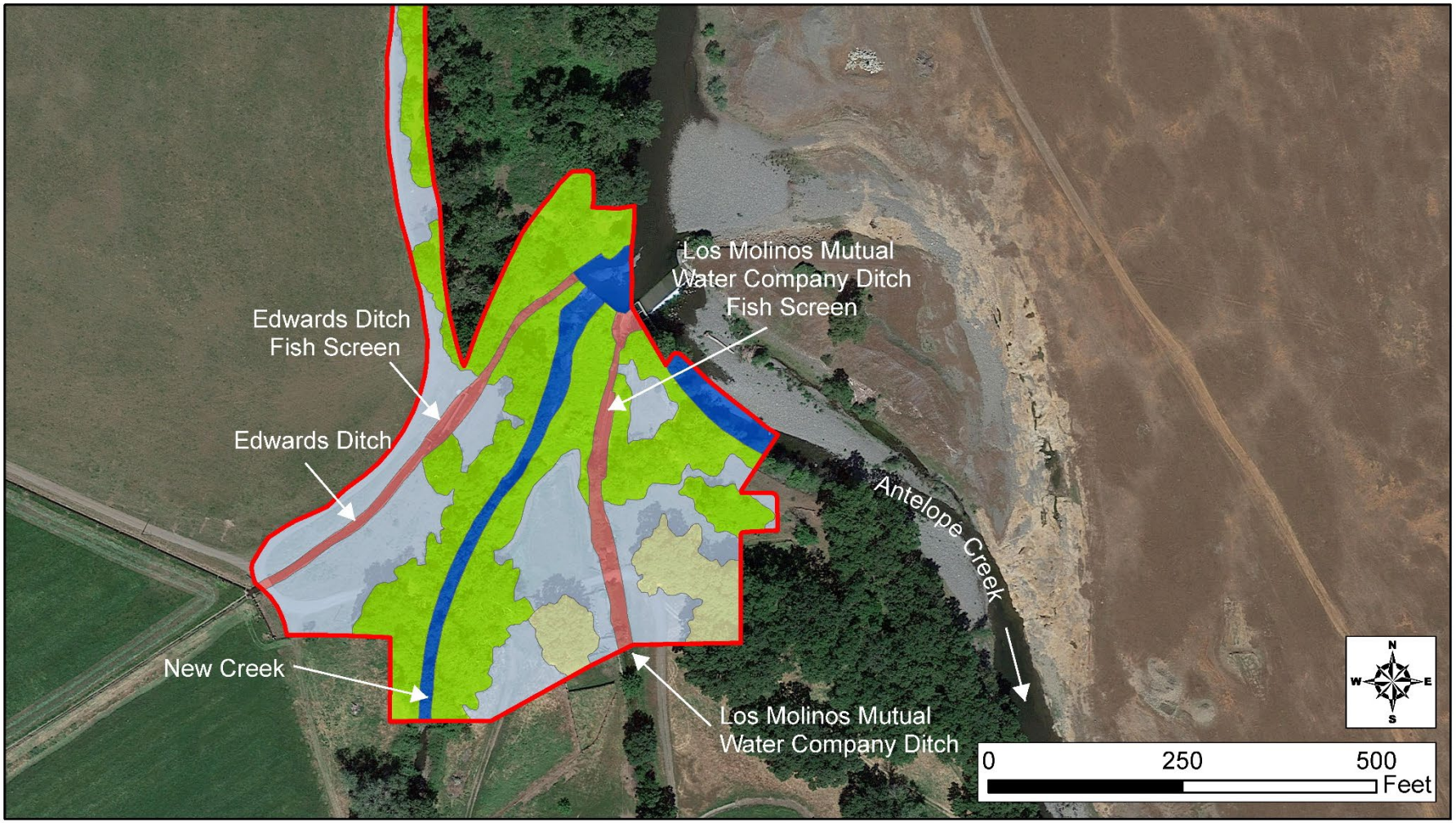
Based on the results of the CNDDB search, the USFWS and NMFS species lists and TES's additional knowledge of the site and local area, a list of potentially occurring special-status species and natural communities was developed for the project and is included as Appendix D. For the purposes of this evaluation, special-status species are defined as:

1. Those species listed by USFWS or NMFS as Endangered, Threatened, Proposed as Endangered or Threatened, Candidate to become Proposed or Species of Concern.
2. Those species listed by CDFW as Endangered, Threatened, Candidate for listing as Endangered or Threatened, Species of Special Concern or Fully Protected.

A biological survey was conducted on May 24 and 25, 2016 by Mr. Jeff Souza, TES Principal Biologist and Ms. Kelly Peterson, former TES Associate Environmental Specialist. Additional biological data were collected by Mr. Souza in 2017, 2018 and 2019 while conducting other work. The study area included the entire project footprint, as well as a varying surrounding buffer area. The surveys were conducted by walking and / or driving portions of the study area that were accessible and recording direct wildlife observations. Observations were made using the unaided eye, binoculars and identification of vocalizations. Other methods may have included observations of animal tracks, scat and bird feathers and using dip nets to sample for aquatic invertebrates. No protocol-level wildlife surveys were conducted. A list of all wildlife species observed during site surveys is included as Appendix E.

In addition, to survey for bat species, two Pettersson DX-500 full spectrum, ultrasound, acoustical recording devices were deployed during the nights of May 24, 25 and 26, 2016. The survey was performed at a time of year that was favorable for detection of all bat species that could potentially occur at the site. The recording devices were deployed at four different locations in order to sample riparian, riverine and oak woodland habitats. A total of 12 detector-nights (one detector for one night) were sampled between the four sites. The sampling occurred from approximately 20 minutes after sunset to 20 minutes before sunrise. Once recorded, the potential bat calls were then analyzed using SonoBat™ 4.2 software to identify calls to the species level. Individual calls were then manually vetted to arrive at the final species list included in Appendix E.

An evaluation of the potential presence of special-status species is included in Appendix D. Based on the results of that evaluation, the Biological Resources Evaluation further evaluated the potential impacts of the proposed project on those species with the potential to occur within, or near the proposed project site. Based on that further evaluation, the following special-status wildlife species, groups of species or CHs are



Legend

Study Area | Annual Grassland | Ditch | Riverine | Valley Foothill Riparian | Valley Oak Woodland

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Antelope Creek Fish Passage Improvement Project

Tehama County, California

September 2019

Figure 15. Wildlife Habitats Map

known to, or may occur within the project area, and could potentially be significantly impacted by the proposed project:

- Western Pond Turtle *(Emys marmorata)*
- Foothill Yellow-legged Frog *(Rana boylii)*
- Long-eared Owl *(Asio otus)*
- Swainson's Hawk *(Buteo swainsoni)*
- Northern Harrier *(Circus cyaneus)*
- White-tailed Kite *(Elanus caeruleus)*
- American Bald Eagle *(Haliaeetus leucocephalus)*
- Yellow-breasted Chat *(Icteria virens)*
- Loggerhead Shrike *(Lanius ludovicianus)*
- Yellow Warbler *(Setophaga petechia)*
- Other Nesting Raptors
- Other Nesting Migratory Birds
- Valley Elderberry Longhorn Beetle *(Desmocerus californicus dimorphus)*
- Pallid Bat *(Antrozous pallidus)*
- Townsend's Big-eared Bat *(Corynorhinus townsendii)*
- Ringtail *(Bassariscus astutus)*
- Western Red Bat *(Lasiurus blossevillii)*

One of these species (valley elderberry longhorn beetle) is federally listed as Threatened. Under Section 7 of the ESA, federal agencies are required to consult with the USFWS regarding impacts from a proposed action to listed species or species proposed for listing, and their designated CH. A *Biological Assessment* (Tehama Environmental Solutions 2019a) has been prepared for the proposed project and consultation with the USFWS has been initiated.

One of these species (Swainson's hawk) is state listed as Threatened. One additional species (foothill yellow-legged frog) is a state candidate for listing as Threatened. Under the California ESA, consultation with CDFW is required for potential impacts to state listed or candidate species. That consultation will occur through the CEQA process and / or through the issuance of a California Fish and Game Code Section 1653 / 1653 Approved Restoration or Enhancement Project.

Western Pond Turtle

The western pond turtle is designated as a CDFW Species of Special Concern. Population declines are attributed to impacts to nesting habitat, nest and juvenile predation by non-native aquatic species, human-induced predator population increases and historic human overexploitation (Jennings and Hayes 1994). This species inhabits quiet waters of ponds, lakes, streams, etc., where there are rocks or logs for basking and safe underwater retreat areas (Stebbins 1972). They are closely tied to water except when females move overland to lay eggs or when either sex may move overland to upland sites to overwinter. They may overwinter on land or in water but are thought to be more likely to overwinter in water when inhabiting pond habitats. Egg-laying typically occurs in May and June but can occur from late April to early August, while overwintering generally begins in October or November (Jennings and Hayes 1994). Hatchlings are thought to overwinter in the nest and emerge to migrate to aquatic habitats the following spring (Jennings and Hayes 1994). The aquatic habitats within Antelope Creek and New Creek provide suitable habitat for this species. No western pond turtles were observed during TES site surveys, however a juvenile western pond turtle was observed at the site during a 2016 site visit by CDFW staff (M. Johnson pers. comm.).

Foothill Yellow-legged Frog

The foothill yellow-legged frog is currently considered a state candidate for listing as Threatened and a CDFW Species of Special Concern. The main reported threat to the species is predation by introduced aquatic predators including fish and bullfrogs (Jennings and Hayes 1994). This species inhabits shallow flowing water in small to moderate-sized streams with some cobble-sized substrate (Jennings and Hayes 1994) in a variety of habitats including valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral and wet meadow from sea level to 6,000 feet in elevation (Ziener et al. 1988). Breeding occurs following the end of spring flooding from mid-March to May (Ziener et al. 1988). Adults forage on aquatic and terrestrial invertebrates and are rarely found far from permanent water (Ziener et al. 1988). The aquatic habitats within Antelope Creek, New Creek, and to a lesser extent both ditches, provide potential habitat for this species. No foothill yellow-legged frogs were observed during site surveys, however this species is known to occur upstream of the project site within the Tehama Wildlife Area (Plemons 2013, T. Bratcher pers. comm.).

Long-eared Owl

The long-eared owl is designated as a Species of Special Concern by CDFW. Declines in long-eared owl populations have been attributed to destruction of lowland riparian woodland habitats, however other unknown factors such as automobile collisions and human harassment may also be contributing factors (Remsen 1978). This species nests and roosts in riparian, live oak or other thickets with small, densely-canopied trees, and primarily hunts in open areas for rodents, as well as birds, smaller owls and other vertebrates (Zeiner et al. 1990a). Breeding occurs from early March to late July (Zeiner et al. 1990a). Long-eared owls may nest in the riparian areas or dense upland woodlands within and near the project area. No long-eared owls were observed during site surveys.

Swainson's Hawk

The Swainson's hawk was listed as Threatened by the State of California in 1983. Threats include loss and conversion of native grasslands and agricultural lands to development, loss of mature riparian forest habitat, shooting, pesticide poisoning and human disturbance at nest sites (Remsen 1978, California Department of Fish and Game 2005). Recovery efforts are focused on preservation of riparian systems and other nesting habitat, conservation of foraging habitat, maintenance of agricultural practices that are compatible with foraging requirements and minimizing disturbance near nests (California Department of Fish and Game 2005). In California, they now nest primarily in the Central Valley and the Great Basin regions (California Department of Fish and Game 2005). Some individuals are neotropical migrants that winter in Mexico and South America. They typically nest from March through August in large trees in riparian habitat, in scattered trees, or small groves in sparsely vegetated flatlands (Zeiner et al. 1990a). They forage in large open grasslands, open agricultural fields and livestock pastures taking mice, gophers, ground squirrels, rabbits, large arthropods, amphibians, reptiles, birds and rarely, fish (Zeiner et al. 1990a). The project area is within the northern end of the geographical breeding range for this species. Potential nesting and foraging habitat is present throughout the project area. No Swainson's hawks were observed during site surveys, however a nest has been recorded approximately 2.5 miles to the southwest of the project site (California Department of Fish and Wildlife 2016) and Swainson's hawks have been observed within approximately one mile of the project site at Cone Grove Park and south of the project site in the Dye Creek Preserve (J. Souza pers. obs.).

Northern Harrier

The northern harrier is a CDFW Species of Special Concern. Reported threats to the species include destruction of marsh habitat, burning and plowing of nesting areas and grazing in grassland nesting habitat (Remsen 1978, Zeiner et al. 1990a). This species nests from April to September on the ground in emergent wetlands, grasslands, agricultural fields or on sagebrush flats (Zeiner et al. 1990a). They forage in open areas consuming small mammals, birds, frogs, small reptiles, crustaceans, insects and rarely, fish (Zeiner et al.

1990a). Potential nesting and foraging habitat for the northern harrier is present in the open grasslands and croplands within, and near the project area. Northern harriers were observed near the project area during site surveys.

White-tailed Kite

The white-tailed kite is designated as a Fully Protected species under the California Fish and Game Code. The species has extended its range and increased in numbers in recent decades (Zeiner et al. 1990a). They are rarely found away from agricultural areas and nest from February to October near the tops of trees in dense oak, willow or other tree stands, near open foraging areas (Zeiner et al. 1990a). They forage on small mammals and occasionally on birds, insects, reptiles and amphibians in undisturbed open grasslands, meadows, farmlands and emergent wetlands (Zeiner et al. 1990a). Potential nesting habitat is present within the project area. No white-tailed kites were observed during site surveys.

American Bald Eagle

The American bald eagle was listed as Endangered by the State of California in 1971, and is designated as a Fully Protected species under the California Fish and Game Code and is protected by the Bald and Golden Eagle Protection Act. The species was originally listed as Endangered by USFWS in 1967, was downlisted to Threatened in 1995 and was delisted in 2007. Past declines in American bald eagle populations are attributed to the effects of DDT, lead shot and habitat disturbance, however in California, the number of territories has increased and the species range has expanded (California Department of Fish and Game 2005). Recovery efforts have focused on the protection of nesting areas and restrictions on the use of DDT. The American bald eagle is a large bird of prey that winters throughout California. They nest in the upper canopy of large trees normally in mountain and foothill habitats near rivers, streams and reservoirs. They forage opportunistically on fish and waterfowl but also prey on other small animals and eat carrion (California Department of Fish and Game 2005). Potential nesting habitat is present within the project area. An assumed bald eagle nest is located approximately 300 feet to the south of the study area, however no nesting activity was observed in 2018 or 2019 (J. Souza pers. obs.). Bald eagles often have several alternative nest locations that can be used in different years so the potential exists for a nesting territory to be reestablished in the future at this site. American bald eagles were observed within the project area during site surveys.

Yellow-breasted Chat

The yellow-breasted chat is designated as a CDFW Species of Special Concern. Threats to the species include destruction of riparian habitat and nest parasitism by brown-headed cowbirds (Remsen 1978). Yellow-breasted chats are neotropical migrant songbirds that nest in dense shrubs along streams and rivers and require dense, brushy thickets and tangles near water for cover. They nest from early May to early August with peak nesting activity in June, and forage on insects, spiders, berries and other fruit (Zeiner et al. 1990a). Potential foraging and nesting habitat is present within the project area. Yellow-breasted chats were observed within the project area during site surveys.

Loggerhead Shrike

The loggerhead shrike is a CDFW Species of Special Concern. Potential threats and reasons for population declines are not well-documented for this species although habitat loss, on breeding and wintering grounds as well as along migratory routes, is a major threat to the species. Loggerhead shrikes construct nests in dense foliage in trees or shrubs in areas with open habitat and scattered shrubs, trees, or other perches. They are found primarily in valley foothill hardwood, hardwood-conifer and riparian habitats as well as pinyon-juniper, juniper and desert riparian Joshua tree habitats (Zeiner et al. 1990a). Nesting occurs from March into May, with young becoming independent in July and August (Zeiner et al. 1990a). They feed primarily on large insects but also take small birds, mammals, amphibians, reptiles, fish, carrion and other invertebrates (Zeiner et al. 1990a). Potential nesting habitat is present in tree and shrub habitats within the project area. Loggerhead shrikes were observed within the project area during site surveys.

Yellow Warbler

The yellow warbler is designated as a CDFW Species of Special Concern. Threats to the species include destruction of riparian habitat and nest parasitism by brown-headed cowbirds (Remsen 1978). Numbers of breeding pairs have declined dramatically in recent decades in lowland areas. Yellow warblers are neotropical migrant songbirds that nest in riparian woodlands as well as in montane chaparral and in the shrubby understory of ponderosa pine and mixed conifer forests (Zeiner et al. 1990a, Shuford and Gardali 2008). They nest from mid-April into early August, with peak nesting activity in June, and eat insects, spiders and occasionally berries (Zeiner et al. 1990a). Potential nesting habitat is present in the riparian areas within the project area. No yellow warblers were observed during site surveys.

Other Nesting Raptors

Nesting habitat exists within, and near the project site for several other raptor species (eagles, hawks and owls) that are not identified as special-status species, but are protected under several sections of the California Fish and Game Code. Several raptor species were observed during site surveys (Appendix E). A number of additional raptor species, while not observed, may potentially nest within, or near the project area. Several large and medium-sized nests and trees with large and medium-sized cavities were observed within, or in the vicinity of the project area that could potentially serve as raptor nests.

Other Nesting Migratory Birds

Nesting habitat exists within the project site for a number of migratory bird species that are not identified as special-status species, but are protected under the federal Migratory Bird Treaty Act and / or under several sections of the California Fish and Game Code (California Department of Fish and Wildlife and California Attorney General 2018).

Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle (VELB) was federally listed as a Threatened species by USFWS on August 8, 1980. Critical Habitat (CH) was designated by USFWS on August 8, 1980. Suggested threats to the existence of this species include loss of elderberry shrubs and associated riparian habitat, pesticide use, grazing and other mismanagement of riparian habitat. Current recovery efforts are primarily focused on revegetating riparian habitats. The VELB is endemic to the Central Valley of California. They are associated with elderberry *(Sambucus spp.)* shrubs during their entire life cycle. VELB larvae bore into and feed on the pithy core of elderberry stems for up to two years before emerging as adults after chewing an exit hole through the stem and bark. The adult beetles feed on elderberry foliage until they mate in early summer. The female then lays eggs in crevices in the bark of the elderberry plant. The project site is not located in, or near the currently designated CH but is located within the known range of the species. Suitable habitat (elderberry shrubs with stems greater than, or equal to, one inch in diameter) exists within the project area. No VELB or definitive exit holes were observed during surveys.

Pallid Bat

The pallid bat is designated as a CDFW Species of Special Concern. Threats to the species include destruction and disturbance of roosting sites which include caves, crevices, mines, and occasionally, hollow trees and buildings (Zeiner et al. 1990b). This species is most common in open, dry areas near rocky sites for roosting in a wide variety of habitats including grasslands, shrublands, woodlands and forests from sea level up through mixed conifer forests (Zeiner et al. 1990b). Females give birth in the early summer in nursery colony roosts and the young are not weaned until the fall. Pallid bats are nocturnal and feed on large arthropods including scorpions, cicadas, katydids, beetles, crickets, grasshoppers, praying mantids and moths (Bolster et al. 1998). Pallid bats were detected within the project area during acoustical site surveys. Pallid bats may be roosting in hollow trees or crevices within, or near the project area.

Townsend's Big-eared Bat

The Townsend's big-eared bat is listed as a CDFW Special Species of Concern. The main threat to this species is loss of roosting sites due to human disturbance, mine closure and renewed mining in abandoned mines. Townsend's big-eared bats occur in a variety of habitats but are more common in mesic sites (Williams 1986). Roosting sites include caves, lava tubes, mine tunnels and large hollow trees as well as other human-made structures such as buildings, bridges and water diversion tunnels. Roosting sites are extremely sensitive to human disturbance and can be abandoned due to a single human visit (Zeiner et al. 1990b), however in some instances this species can become habituated to reoccurring and predictable human activity (California Department of Fish and Wildlife 2013). Females give birth from May to July in nursery colony roosts and the young are generally weaned by August. Townsend's big-eared bats are nocturnal and feed primarily on large moths but also take small numbers of other insects (Bolster et al. 1998). Townsend's big-eared bats may potentially roost in hollow trees within, or near the project area. Townsend's big-eared bats were not detected within the project area during acoustical site surveys, however they are difficult to detect acoustically.

Ringtail

The ringtail is designated as a Fully Protected species under the California Fish and Game Code. Threats to the species include urbanization and loss and degradation of riparian communities (Williams 1986). This medium-sized carnivore inhabits forests and shrublands in close association with riparian habitats or rocky areas. They are usually found within 0.6 miles of permanent water (Zeiner et al. 1990b) in low to middle elevations. Ringtails den and nest in hollow trees, snags, cavities in rocks, abandoned burrows and human structures. Ringtail primarily feed on rodents and rabbits and also birds and eggs, reptiles, invertebrates, fruits, nuts and some carrion. Potential denning habitat for ringtails is present in riparian habitats within the project area. No ringtails were observed during site surveys, however they are seldom observed without the use of specialized survey methods due to their strongly nocturnal nature.

Western Red Bat

The western red bat is designated as a CDFW Species of Special Concern. Potential threats to this species include loss of riparian habitat from habitat conversions and fatalities from wind turbines. Their roosting habitat includes forests and woodlands, ranging from sea level to mixed conifer forests. They roost in foliage near edge habitats adjacent to streams, fields or urban areas in trees (Zeiner et al. 1990b). The western red bat hibernates in the winter and is generally considered a solitary species. They feed over a wide variety of habitats including grasslands, shrublands, open woodlands and forests, and croplands. They are nocturnal and feed primarily on insects such as moths, crickets, beetles and cicadas. Breeding occurs in August and September and, after delayed fertilization, females give birth between late May and early July. Western red bats may roost in riparian habitats within, or near the project area. Western red bats were detected within the project area during acoustical site surveys.

No Action Alternative

Under this alternative, there would be no impacts to wildlife, including special-status wildlife species because the project would not be implemented. Baseline levels of disturbance to wildlife populations as a result of farming, ranching and diversion maintenance activities would continue to occur at current levels.

Proposed Action Alternative

Under this alternative, activities from the proposed project would potentially cause significant impacts to the following species. Project activities that could cause significant impacts include people and equipment working at the project site, vegetation removal and noise from construction activities.

Western Pond Turtle

Under this alternative, western pond turtles could be harmed or killed if they were present within the project area during construction activities. This is considered a potentially significant impact.

Foothill Yellow-legged Frog

Under this alternative, foothill yellow-legged frog could be harmed or killed if they were present within the project area during construction activities. This is considered a potentially significant impact.

Long-eared Owl

Under this alternative, project activities could cause nests to be destroyed or abandoned if active long-eared owl nests were present within or near the project area during construction activities. This is considered a potentially significant impact.

Swainson's Hawk

Under this alternative, project activities could cause nests to be destroyed or abandoned if active Swainson's hawk nests were present within or near the project area during construction activities. This is considered a potentially significant impact.

Northern Harrier

Under this alternative, project activities could cause nests to be destroyed or abandoned if active northern harrier nests were present within or near the project area during construction activities. This is considered a potentially significant impact.

White-tailed Kite

Under this alternative, project activities could cause nests to be destroyed or abandoned if active white-tailed kite nests were present within or near the project area during construction activities. This is considered a potentially significant impact.

American Bald Eagle

Under this alternative, project activities could cause harassment, habitat modification or nest abandonment if active American bald eagle nests were present within or near the project area during construction activities. This is considered a potentially significant impact. Beneficial effects to this species could occur as a result of the proposed alternative from the potential increase in prey abundance, as a result of improved salmonid and other native fish species.

Yellow-breasted Chat

Under this alternative, project activities could cause nests to be destroyed or abandoned if active yellow-breasted chat nests were present within or near the project area during construction activities. This is considered a potentially significant impact.

Loggerhead Shrike

Under this alternative, project activities could cause nests to be destroyed or abandoned if active loggerhead shrike nests were present within or near the project area during construction activities. This is considered a potentially significant impact.

Yellow Warbler

Under this alternative, project activities could cause nests to be destroyed or abandoned if active yellow warbler nests were present within or near the project area during construction activities. This is considered a potentially significant impact.

Other Nesting Raptors

Under this alternative, project activities could cause nests to be destroyed or abandoned if other active raptor nests were present within or near the project area during construction activities. This is considered a potentially significant impact.

Other Nesting Migratory Birds

Under this alternative, project activities could cause nests to be destroyed or abandoned if other active migratory bird nests were present in the project vicinity during construction activities. This is considered a potentially significant impact.

Valley Elderberry Longhorn Beetle

Under this alternative, VELB could be impacted through harassment, modifications to suitable habitat and injury or mortality from project construction activities, if they were present within the project site during construction activities. Suitable habitat for this species is present within 100 feet of the proposed project construction activities. Potential activities that could impact this species include direct disturbance to existing elderberry shrubs, disturbance within 100 feet of the drip line of the elderberry shrubs or impacts from dust. This is considered a potentially significant impact.

Pallid Bat

Under this alternative, pallid bats could be harmed or killed if active pallid bat day roosts were present within the project site and were disturbed by vegetation removal activities. This is considered a potentially significant impact.

Townsend's Big-eared Bat

Under this alternative, Townsend's big-eared bats could be harmed or killed if active Townsend's big-eared bats day roosts were present within the project site and were disturbed by vegetation removal activities. This is considered a potentially significant impact.

Ringtail

Under this alternative, ringtail could be harmed or killed if active ringtail dens or nests were present within the project sites and were disturbed by project construction activities. This is considered a potentially significant impact.

Western Red Bat

Under this alternative, western red bats could be harmed or killed if active western red bats day roosts were present within the project site and were disturbed by vegetation removal activities at a time when juvenile bats are still unable to fly. This is considered a potentially significant impact.

There are no adopted habitat conservation plans, natural community conservation plans or other conservation plans in the project area. The proposed project would not be in conflict with any local policies or ordinances protecting biological resources.

The following measure would be implemented to avoid and minimize impacts to wildlife and to mitigate potentially significant impacts listed above to wildlife to less than significant levels:

> **WILDLIFE-1:** Within seven (7) calendar days prior to the onset of potentially disturbing construction activities, areas that will be disturbed within 100 feet of water bodies shall be surveyed by a qualified biologist to determine if any western pond turtles or turtle nests are present. If any turtles or turtle nests are found, a qualified and permitted biologist shall determine and implement appropriate relocation procedures, in coordination with California Department of Fish and Wildlife (CDFW). The site shall be checked daily by trained construction workers prior to work commencing, including underneath vehicles

and equipment that will be used. If turtles are found, they will be moved by a qualified and permitted biologist to an area of safety out of harm's way.

WILDLIFE-2: Within seven (7) calendar days prior to work in aquatic habitats, water bodies shall be surveyed by a qualified biologist to determine if any foothill yellow-legged frogs are present. If any foothill yellow-legged frogs are found, a qualified and permitted biologist shall determine and implement appropriate relocation procedures, in coordination with CDFW. The site shall be checked daily by trained construction workers prior to work commencing, including underneath vehicles and equipment that will be used. If foothill yellow-legged frogs are found, they will be moved by a qualified and permitted biologist to an area of safety out of harm's way.

WILDLIFE-3: Any tree removal, vegetation clearing, or the onset of potentially disturbing construction activities shall occur between September 1 and January 1 (outside of the nesting season for raptors with potential to occur within, or in the vicinity of the project site). Note: Also see measure WILDLIFE-4.

If tree removal, vegetation clearing, or the onset of potentially disturbing construction activities must occur during the nesting season, a raptor nesting survey of the construction area and adjacent suitable habitat shall be conducted by a qualified biologist no more than seven (7) calendar days prior to the initiation of the onset of these activities or as appropriate survey protocols require. If active raptor nests are found to be present, tree removal, vegetation clearing and the onset of potentially disturbing construction activities shall be suspended until a qualified biologist, in consultation with CDFW and / or USFWS can establish an appropriate protective buffer area to minimize impacts to the nesting raptors. No construction activities shall commence within the buffer area until the qualified biologist determines that the young birds have fledged or the nest is no longer active.

Construction activities shall occur continuously (not including weekends) until the end of the nesting season to discourage raptors from initiating nesting. If construction activities cease for more than seven (7) consecutive days (including weekends), all construction activities shall cease until CDFW can be consulted to determine if a subsequent raptor nesting survey must be performed.

Active or inactive nests are not to be disturbed or removed as a result of construction activities without CDFW consultation per Fish and Game Code Section 3503.5.

WILDLIFE-4: Any tree removal, vegetation clearing, or the onset of potentially disturbing construction activities shall occur between August 1 and March 1 (outside of the nesting season for grasshopper sparrow, yellow-breasted chat, loggerhead shrike, yellow warbler and other nesting migratory birds). Note: Also see measure WILDLIFE-3.

If tree removal, vegetation clearing, or the onset of potentially disturbing construction activities must occur during the nesting season, a nesting survey of the construction area and adjacent suitable habitat shall be conducted by a qualified biologist no more than seven (7) calendar days prior to the initiation of the onset of these activities. If active bird nests are found to be present, tree removal, vegetation clearing and the onset of potentially disturbing construction activities shall be suspended until a qualified biologist, in consultation with CDFW, can establish an appropriate protective buffer area to minimize impacts to the nesting birds. No construction activities shall commence within the buffer area until the qualified biologist determines that the young birds have fledged or the nest is no longer active.

Construction activities shall occur continuously (not including weekends) until the end of the nesting season to discourage avian species from initiating nesting. If construction activities cease for more than seven (7) consecutive days (including weekends), all construction activities shall cease until CDFW can be consulted to determine if a subsequent nesting bird survey must be performed.

Active nests are not to be disturbed or removed as a result of construction activities per Fish and Game Code Section 3503.

WILDLIFE-5: Prior to the onset of potentially disturbing construction activities during the nesting season, a Swainson's hawk nesting survey of the construction area and adjacent suitable habitat shall be conducted by a qualified biologist in accordance with the protocols in *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee 2000). If active Swainson's hawk nests are found to be present, the onset of potentially disturbing construction activities shall be suspended until a qualified biologist, in consultation with CDFW, can establish an appropriate protective buffer area to minimize impacts to the nesting birds. No construction activities shall commence within the buffer area until the qualified biologist determines that the nest is no longer active.

WILDLIFE-6: Prior to any vegetation removal, an attempt will be made by a qualified biologist to determine if pallid bats, Townsend's big-eared bats or western red bats are roosting in the area to be removed / disturbed.

If pallid bats, Townsend's big-eared bats or western red bats are found to be roosting within the area to be removed / disturbed, these activities shall be suspended until a qualified biologist, in consultation with CDFW, can establish appropriate measures to minimize impacts to these species.

WILDLIFE-7: To the extent possible, all direct disturbance to identified bat roosts shall occur between August 31 and May 1, in order to minimize the likelihood of injuring or killing juvenile bats during the period when they are still unable to fly.

WILDLIFE-8: To the extent possible, the removal of trees or branches with defects (cavities, cracks, exfoliating bark, etc.) that provide potential bat roosting or bird roosting / nesting habitat will be avoided.

WILDLIFE-9: As appropriate, revegetation efforts will incorporate tree and vine species that are known to be used by western red bats for roosting including, but not limited to white alder *(Alnus rhombifolia)*, California sycamore *(Platanus racemosa)*, pipevine *(Aristolochia californica*) and California grape *(Vitis californica)*.

WILDLIFE-10: Prior to the onset of construction activities, a construction worker education program shall be implemented that includes an explanation of all special-status animal species, identification, avoidance measures, and federal and state laws that protect the species. This shall include, at a minimum, those species described in the environmental documents.

WILDLIFE-11: Prior to the onset of construction activities, a qualified biologist will inspect the project site for signs of denning by ringtails.

If ringtails are found to be denning, construction activities will be suspended until a qualified biologist, in consultation with CDFW, can establish appropriate measures to protect ringtail.

WILDLIFE-12: The project shall comply with the current Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*) (U.S. Fish and Wildlife Service 2017).

WILDLIFE-13: The USFWS shall be consulted to 1) develop appropriate avoidance and minimization measures, and 2) determine whether an Endangered Species Act Section 7 take permit will be required for the project. All protective measures imposed by USFWS through the consultation shall be adhered to.

WILDLIFE-14: Prior to construction, all elderberry shrubs to be avoided within 150 feet of any project activity will be clearly flagged, marked and maintained throughout construction in order to avoid impacts to the valley elderberry longhorn beetle. All elderberry shrubs to be avoided within 100 feet of project activity will be marked with high-visibility orange fencing.

WILDLIFE-15: Signs will be installed every 50 feet, on the fencing of all elderberry shrubs within 100 feet of any project related activities with the following information: "This area is habitat for the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and

imprisonment." Signs will be clearly readable from a distance of 20 feet and will be maintained for the duration of construction.

WILDLIFE-16: Prior to construction, elderberry shrubs which cannot be avoided by project related activities with one or more stems measuring 1.0 inch or greater in diameter at ground level shall be transplanted onsite.

A qualified biologist (monitor) must be onsite for the duration of the transplanting of the elderberry plants to insure that no unauthorized take of the valley elderberry longhorn beetle occurs. If unauthorized take occurs, the monitor must have the authority to stop work until corrective measures have been completed and must immediately report any unauthorized take of the beetle or its habitat to the USFWS and to CDFW.

Elderberry shrubs will be transplanted during dormancy, from November 1 through the first two weeks of February, after the shrubs have lost their leaves, following the specific transplanting guidance provided in the *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus)* (U.S. Fish and Wildlife Service 2017).

WILDLIFE-17: A qualified biologist (biological monitor) shall regularly inspect construction-related activities to ensure that no unnecessary disturbance to special-status species and / or their associated habitats occurs. The biological monitor shall have the authority to stop all activities that may result in such disturbance until appropriate corrective measures have been completed. The biologist will also be required to report any unauthorized take to CDFW, USFWS and / or NMFS immediately.

WILDLIFE-18: All food-related trash will be disposed of in closed containers and removed from the project area daily during the construction period. Construction personnel will not feed or otherwise attract wildlife to the project area.

WILDLIFE-19: No pets will be allowed within the project area.

3.4.7 Wetlands and Other Jurisdictional Waters of the U.S.

3.4.8 Affected Environment

Wetlands and other potentially jurisdictional waters of the U.S. (other waters) are present within the project area, associated with Antelope Creek, New Creek and human-made features associated with the diversion system that carries the water diverted by the EDD. Based on the presence / absence of indicators of wetland hydrology, hydrophytic vegetation and hydric soils, 0.43 acres of potentially jurisdictional wetlands were identified. Based on the presence of an Ordinary High Water Mark (OHWM), 1.54 acres of potentially jurisdictional other waters of the U.S. were also identified and delineated. A total of 0.35 acres of the other waters of the U.S. are composed of the ditch system, which are not jurisdictional under current law (33 CFR 328.3(b)(3). Table 3 presents a summary of the total acreage of the potentially jurisdictional waters of the U.S.

Wetlands

Riparian Wetland

The Riparian Wetland (RW) features are present on the stream bank and floodplains associated with Antelope Creek and New Creek. The vegetation varies by location within the study area. The tree and shrub layer is dominated by white alder, California sycamore, valley oak, sandbar willow and arroyo willow. Other species present in the tree and shrub layer include Oregon ash, Fremont cottonwood, black walnut, blue elderberry and edible fig. The dominant woody vine species include California grape, California pipevine and Himalayan blackberry. Native herbaceous dominants include mugwort and torrent sedge.

Table 3. Summary of Preliminary Delineated Waters of the U.S.	
Wetlands	**Total Acreage**
Riparian Wetland	0.43
Total Wetlands	**0.43**
Other Waters	**Total Acreage**
Ditch	0.35
Intermittent Stream	0.28
Perennial Stream	0.91
Total Other Waters	**1.54**
TOTAL WATERS OF THE U. S.	**1.98**

Other Waters of the U.S.

Perennial Stream

A perennial stream is present within the channel of Antelope Creek. The creek channel is primarily devoid of vegetation, but the banks of the stream support a discontinuous band of woody riparian vegetation.

Intermittent Stream

One intermittent stream is present within the channel of New Creek, which is a distributary of Antelope Creek. This stream supports a continuous band of riparian vegetation on both banks.

Ditch

The ditch systems as currently operated do not represent jurisdictional waters of the U.S. Under 33 CFR 328.3(b)(3), ditches that: (i) only carry ephemeral flow that are not a relocated tributary or excavated in a tributary; (ii) only carry intermittent flow that are not a relocated tributary or excavated in a tributary; or (iii) that do not flow, either directly or through another water, into a jurisdictional water, are not "waters of the United States." In this case, all three of these exemptions appear to apply to the ditches. The ditches are concrete-lined in some reaches and unlined in others.

3.4.9 Environmental Consequences / Impacts and Mitigation Measures

Methodology

The assessment of potential impacts of the proposed project on wetlands and other jurisdictional waters of the U.S. is based on consultations with resource agency staff and field studies that are documented in a *Revised Delineation of Waters of the U.S.* (Tehama Environmental Solutions 2019b) that was prepared for the proposed project. This document is available on the RCDTC website (http://www.tehamacountyrcd.org) and the Red Bluff Fish and Wildlife Office website on the AFRP webpage (http://www.fws.gov/redbluff/afrp.html).

A delineation of waters of the U.S. was conducted within the study area on May 24 and 25, 2016 by Mr. Souza and Ms. Peterson of TES and on June 13, 2017 by Mr. Souza. The delineation was conducted in accordance with the *1987 Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (U.S. Army Corps of Engineers 2008) using a Routine Determination Method. Based on the results of the delineation, maps of all identified wetlands and other waters were prepared (Figure 16). The maps are considered preliminary until they are verified by the USACE.

No Action Alternative

Under this alternative, there would be no impacts to wetlands or other waters. The fish passage improvements would not be constructed in Antelope Creek and the two ditches and the siphon would not be constructed under New Creek.

Proposed Action Alternative

Under this alternative, as a result of the construction of the fish passage improvements and diversion system modifications, some of the wetland and other waters of the U.S. features would be temporarily and permanently impacted as represented in Table 4. This is considered a potentially significant impact.

Table 4. Impact to Preliminary Waters of the U.S. Antelope Creek Fish Passage Improvement Project

Impacts (acres)	Wetlands	Other Waters			Totals
Type	Riparian Wetland	Perennial Stream	Intermittent Stream	Ditch	
Temporary	0.04	0.08	0.03	0.03	**0.18**
Permanent	0.01	0.02	0.03	0.11	**0.14**

The following measures would be implemented to avoid and minimize impacts to wetlands and other jurisdictional waters of the U.S. and to mitigate potentially significant impacts listed above to wetlands and other jurisdictional waters of the U.S. to less than significant levels:

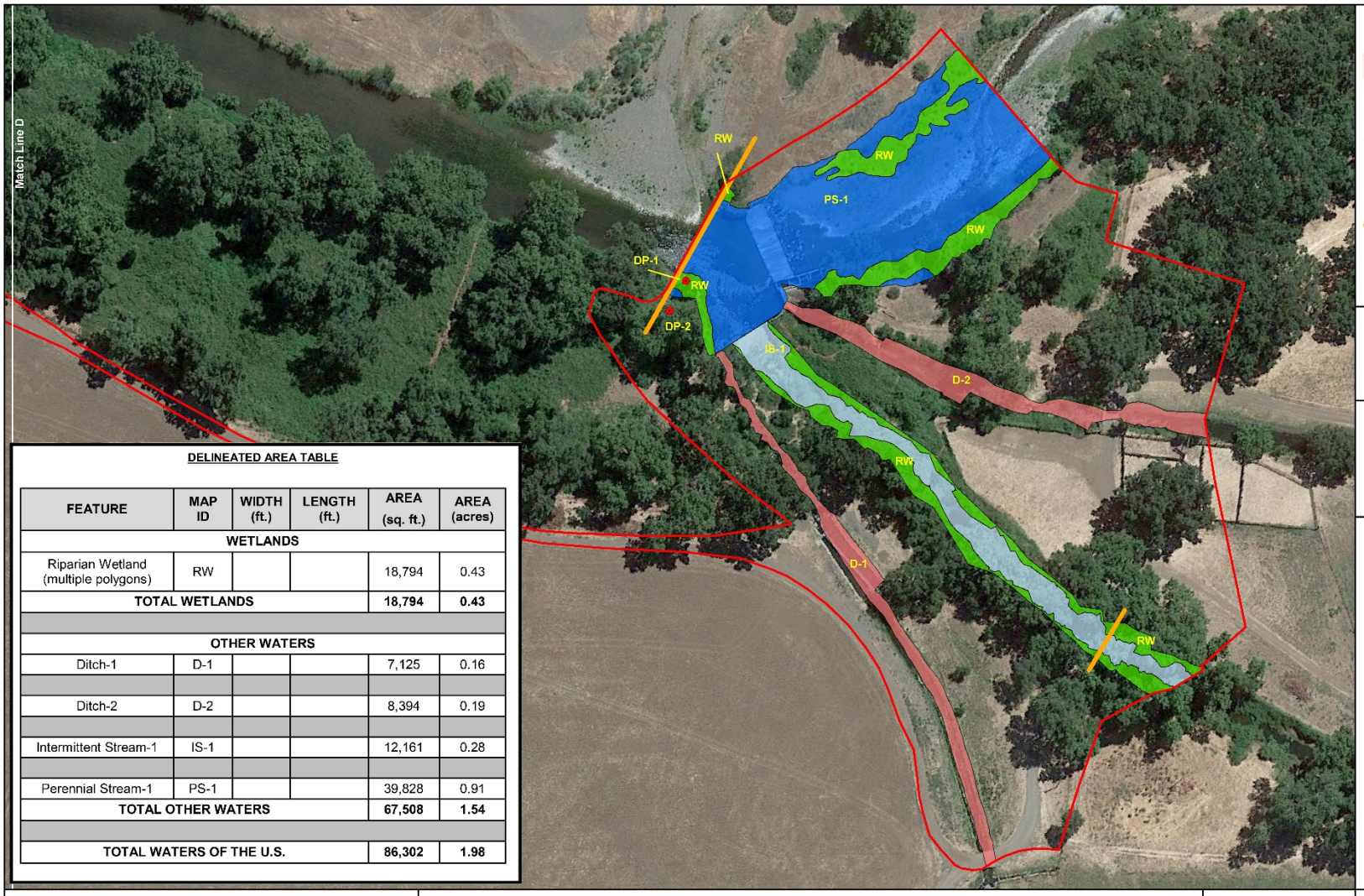
WETLAND-1: Project activities will avoid impacts to wetlands and other aquatic habitats to the extent possible.

WETLAND-2: High-visibility fencing will be installed in areas where equipment will be working near any wetlands and / or riparian habitat that are not to be disturbed.

WETLAND-3: Construction crews will be informed about the importance of avoiding sensitive areas, including wetlands.

WETLAND-4: A Clean Water Act Section 404 Permit will be obtained from the U.S. Army Corps of Engineers and a Clean Water Act Section 401 Certification will be obtained from the Central Valley Regional Water Quality Control Board (RWQCB).

WETLAND-5: A California Fish and Game Code Section 1600 Lake or Streambed Alteration Agreement will be obtained from CDFW.



DELINEATED AREA TABLE

FEATURE	MAP ID	WIDTH (ft.)	LENGTH (ft.)	AREA (sq. ft.)	AREA (acres)
WETLANDS					
Riparian Wetland (multiple polygons)	RW			18,794	0.43
TOTAL WETLANDS				**18,794**	**0.43**
OTHER WATERS					
Ditch-1	D-1			7,125	0.16
Ditch-2	D-2			8,394	0.19
Intermittent Stream-1	IS-1			12,161	0.28
Perennial Stream-1	PS-1			39,828	0.91
TOTAL OTHER WATERS				**67,508**	**1.54**
TOTAL WATERS OF THE U.S.				**86,302**	**1.98**

Legend

- Study Area (9.01 Acres)
- Perennial Stream
- Riparian Wetland
- Intermittent Stream
- Ditch
- OHWM Datasheet Cross Sections
- Data Points

Revised Preliminary Delineation Map

DELINEATION / GPS MAPPING

Jeff Souza
Kelly Peterson
Tehama Environmental Solutions, Inc.

CLIENT

RESOURCE CONSERVATION DISTRICT OF TEHAMA COUNTY

TEHAMA ENVIRONMENTAL SOLUTIONS, INC.
910 Main Street, Suite D, Red Bluff, CA 96080
(530) 528-8272 • www.tehamaenviromental.com

Delineation of Waters of the U.S.

Antelope Creek Fish Passage Improvement Project

Tehama County, California

SCALE

0 100 200 Feet

1 in = 100 ft (11" X 17" paper)

September 2019

NOTE: DELINEATION SHOULD BE CONSIDERED PRELIMINARY UNTIL VERIFIED BY THE U.S. ARMY CORPS OF ENGINEERS

PHOTO SOURCE: Google Earth, 6/27/2018

Figure 16. Revised Preliminary Delineation Map

3.4.10 Fisheries

3.4.11 Affected Environment

Antelope Creek is an important watershed, as it is one of the few remaining spawning habitats for the Central Valley spring-run Chinook salmon (herein referred to as spring-run salmon or spring-run). Habitat in the upper portions of the Antelope Creek watershed is considered to be in good condition, however impeded access to adult spawning areas and warm water temperatures, especially during drought years, are listed as stressors (National Marine Fisheries Service 2014).

Fisheries in Antelope Creek include both resident and anadromous species. Anadromous species include the spring-run Chinook salmon listed as Threatened under both the federal Endangered Species Act (ESA) and the California Endangered Species Act (CESA), and the Central Valley steelhead *(Oncorhynchus mykiss)*, which is listed as Threatened under the federal ESA. Antelope Creek also supports anadromous populations of fall- / late fall-run Chinook salmon *(Oncorhynchus tshawytscha)* and Pacific lamprey *(Entosphenus tridentatus),* all designated as Species of Special Concern by CDFW. Some of the native resident fish in Antelope Creek include riffle sculpin (*Cottus gulosus*) and hardhead (*Mylopharodon conocephalus*), which are both designated as Species of Special Concern by CDFW, Sacramento sucker (*Catostomus occidentalis*), prickly sculpin *(Cottus asper)*, threespine stickleback *(Gasterosteus aculeatus)*, California roach (*Lavinia symmetricus*), resident rainbow trout *(Oncorhynchus mykiss),* Sacramento pikeminnow (*Ptychocheilus grandis*), and speckled dace (*Rhinichthys osculus*) (Tehama County Resource Conservation District 2010, Plemons 2013).

Non-native fish species are also present in Antelope Creek. Exotic species known to occur include brown trout *(Salmo trutta)*, green sunfish *(Lepomis cyanellus)* and smallmouth bass *(Micropterus dolomieu)* (Tehama County Resource Conservation District 2010).

The proposed project would contribute toward the implementation goals of several existing Central Valley fish and wildlife restoration plans to create a healthier, more natural functioning ecosystem; enhance and restore aquatic and riparian habitats; protect threatened and endangered species; and augment cumulative efforts to at least double populations of anadromous fish in Central Valley streams. The proposed project is consistent with recommendations for Antelope Creek in the NMFS *Recovery Plan for Central Valley Chinook Salmon and Steelhead* (National Marine Fisheries Service 2014). The proposed project is also consistent with Senate Bill 1086, passed into law in 1986, to help reverse trends of declining salmon runs and loss of riparian habitat in the upper Sacramento River system. This required development of a plan to establish priority actions for the upper Sacramento River and its tributaries between the Feather River and Keswick Dam. The project is also consistent with a number of other pertinent fisheries planning documents including the goals stated in *Restoring Central Valley Stream: A Plan for Action* (Reynolds et al. 1993), goals stated in the *Report to the Fish and Game Commission: A Status Review of the Spring-run Chinook Salmon (Oncorhynchus tshawytscha) in the Sacramento River Drainage* (California Department of Fish and Game 1998), measures to protect habitat for anadromous and resident fisheries along Antelope Creek as stated in the *Lassen Resource Management Plan* (U.S. Forest Service 1992) and the goals and mission of the CALFED Bay-Delta Program's Ecosystem Restoration Program Plan (ERPP). The foundation of this program is restoration of ecological processes which are associated with stream flow, stream channels watersheds, and floodplains.

The proposed project is located at a project site within, and along the valley reach of Antelope Creek and New Creek (a distributary of Antelope Creek) approximately nine stream miles upstream of Antelope Creek's confluence with the Sacramento River. Upstream of the valley floor, the limit to upstream fish migration is determined by natural stream conditions including higher stream gradients, reduced stream flows and habitat availability in the headwater reaches (Armentrout et al. 1998). Antelope Creek provides 35 miles of anadromous habitat including the mainstem, and the north and the south forks of Antelope Creek. The north

fork provides approximately four miles of anadromous habitat and the south fork provides approximately seven miles (Stillwater Sciences and the Resource Conservation District of Tehama County 2015).

Water flows and temperatures vary significantly based on the amount and timing of fall, winter and spring rainfall, as well as irrigation timing. See the Hydrology section of this document (Section 3.10) for more detailed information regarding the hydrology and water quality of Antelope Creek.

Historically, Antelope Creek is reported to have supported an annual average of approximately 500 adult spring-run and 300 steelhead (Armentrout at al. 1998). A substantial amount of salmonid fisheries data have been sporadically collected for Antelope Creek. Table 5, Table 6 and Table 7 provide a summary of the reported annual spring-run Chinook salmon, fall-run Chinook salmon and steelhead population estimates and counts in Antelope Creek for varying time periods. Population estimates have been conducted using a variety of methodologies including carcass surveys, snorkel surveys, redd counts and a video fish monitoring station.

Table 5. Central Valley Spring-run Chinook Escapement Estimates

Year	Escapement	Year	Escapement
1953	127	2004	3
1956	253	2005	82
1959	40	2006	102
1983	59	2007	26
1993	3	2008	3
1994	0	2009*	0
1995	7	2010*	17
1996	1	2011*	6
1997	0	2012*	1
1998	154	2013*	0
1999	40	2014*	7
2000	9	2015*	5
2001	8	2016*	7
2002	46	2017*	8
2003	46	2018*	1

(Sources: Azat 2019, Harvey Arrison 2008) * Preliminary data

Table 6. Central Valley Fall-run Chinook Escapement Estimates

Year	Escapement	Year	Escapement
1953	4,000	1972	275
1954	1,000	1973	200
1955	900	1974	440
1956	327	1975	90
1957	838	1976	60
1958	400	1977	660
1960	250	1981	407
1962	800	1982	162
1963	300	1983	60
1964	50	1984	260
1965	60	1992	0
1966	200	2014*	143
1967	60	2015*	6
1968	80	2016*	138
1969	180	2017*	3
1970	400	2018*	0
1971	205		

(Source: Azat 2019) * Preliminary data

Table 7. Central Valley Steelhead Escapement Estimates / Counts			
Year	Escapement / Count	Year	Escapement / Count
2008	125	2015	45
2013	1	2016	94
2014	202	2017	23

(Source: Killam 2009, Killam et al. 2014, Killam et al. 2015, Killam et al. 2016, Killam et al. 2017, Killam and Mache 2018)

Because neither of the fish screen systems in the two ditches currently include fish bypass pipes, CDFW has been manually rescuing fish in some years from the two screen bays since the early 1980s. Table 8 provides a summary of the steelhead and Chinook salmon that have been rescued by year.

Table 8. Juvenile Salmonids Salvaged at the Edwards and Los Molinos Diversions on Antelope Creek			
Year	Steelhead	Chinook Salmon	Total
1981	18	37	55
1984	19	467	486 ǂ
1985	100	851	951 ǂ
1987	61	134	195 ǂ
1988	0	615	615
1990	0	880	880 ǂ
1994	0	16,325	16,325 * ǂ
1999	0	1,485	1,485 ǂ
2001	0	1,200	1,200 ǂ
2004	0	1,189	1,189 ǂ
2007	0	12,550	12,550 ǂ
2008	186	550	736 ǂ
2011	3	197	200
2012	17	141	158
2013	142	1,118	1,260
2014	199	0	199
2015	23	121	144
2016	127	1	128
2017	0	100	100
2018	10	0	10
2019	22	0	22

(Source: California Department of Fish and Wildlife Office Files, M. Johnson pers. comm.)
Missing years assumes no rescue efforts were conducted
* Counts were estimated
ǂ Numbers recorded for Chinook may also include an undetermined number of steelhead young of the year

3.4.12 Environmental Consequences / Impacts and Mitigation Measures

Methodology

The assessment of potential impacts of the proposed project on fisheries is based on a review of databases and pertinent literature, consultation with resource agency staff, and field studies that are documented in a *Biological Resources Evaluation* (Tehama Environmental Solutions 2017) that was prepared for the proposed project. This document is available on the RCDTC website (http://www.tehamacountyrcd.org) and the Red Bluff Fish and Wildlife Office website on the AFRP webpage (http://www.fws.gov/redbluff/afrp.html).

Prior to the initiation of field studies, a records search of the CNDDB (California Department of Fish and Wildlife 2016) was conducted to determine if any special-status animals, or rare natural communities had previously been documented within the study area, or in the vicinity of the study area. The query was

conducted using the USGS Red Bluff East 7.5-minute quadrangle, in which the project is located, along with the eight adjoining quadrangles (Bend, Dales, Tuscan Springs, Los Molinos, Gerber, West of Gerber, Red Bluff West and Hooker). In addition, species lists for the study area were requested from USFWS (U.S. Fish and Wildlife Service 2019) and NMFS (National Marine Fisheries Service 2019).

Based on the results of the CNDDB search, the USFWS and NMFS species lists and TES's additional knowledge of the site and local area, a list of potentially occurring special-status species and natural communities was developed for the project and is included as Appendix D. For the purposes of this evaluation, special-status species are defined as:

1. Those species listed by USFWS or NMFS as Endangered, Threatened, Proposed as Endangered or Threatened, Candidate to become Proposed or Species of Concern.
2. Those species listed by CDFW as Endangered, Threatened, Candidate for listing as Endangered or Threatened, Species of Special Concern or Fully Protected.

Field surveys and additional observations were made during work conducted at the project site for other purposes in 2017, 2018 and 2019 by TES staff. The study area included all aquatic sites within the project boundary. The surveys were conducted by walking the entire project site and recording fisheries observations. No snorkel surveys, or other intensive fisheries surveys were conducted. A list of all fish species observed during field surveys is included in Appendix E.

An evaluation of the potential presence of special-status species is included in Appendix D. Based on the results of that evaluation, the Biological Resources Evaluation further evaluated the potential impacts of the proposed project on those species with the potential to occur within, or near the proposed project site. Based on that further evaluation, the following special-status fish species, designated CH and Essential Fish Habitat (EFH) are known to, likely to, or have the potential to occur within the project area, and could potentially be significantly impacted by the proposed project:

- Riffle Sculpin *(Cottus gulosus)*
- Pacific Lamprey *(Entosphenus tridentatus)*
- Hardhead *(Mylopharadon conocephalus)*
- Central Valley Steelhead *(Oncorhynchus mykiss)*
- Central Valley Fall- / Late Fall-run Chinook Salmon *(Oncorhynchus tshawytscha)*
- Central Valley Spring-run Chinook Salmon *(Oncorhynchus tshawytscha)*
- Central Valley Steelhead Critical Habitat
- Central Valley Spring-run Chinook Salmon Critical Habitat
- Pacific Salmon Essential Fish Habitat

Two of these species (Central Valley steelhead, Central Valley spring-run Chinook salmon) are federally listed as Threatened. Under Section 7 of the ESA, federal agencies are required to consult with NMFS regarding impacts from a proposed action to listed species or species proposed for listing, and their designated CH and EFH. A Biological Assessment (Tehama Environmental Solutions 2019a) has been prepared for the proposed project and consultation with NMFS has been initiated.

One of these species (Central Valley spring-run Chinook salmon) is state listed as Threatened. Under the California ESA, consultation with CDFW is required for potential impacts to state listed or candidate species. That consultation will occur through the CEQA process, through the issuance of a California Fish and Game Code Section 1653 / 1653 Approved Restoration or Enhancement Project and / or an incidental take permit from CDFW.

Riffle Sculpin

The riffle sculpin is designated as a CDFW Species of Special Concern. It is reported that the riffle sculpin faces numerous threats from dams, agricultural runoff, urbanization mining and logging (Moyle et al. 2015). Both adult and young riffle sculpin have poor dispersal abilities (Moyle et al. 2015). Larvae do not move far after hatching and this greatly reduces their ability to quickly recolonize areas (Moyle et al. 2015). They are found in isolated watersheds in the Central Valley and the central coast. In the Sacramento River drainage, they are found in Putah Creek, a west-side tributary and in most of the east-side tributaries, from the American River north to the upper Sacramento and McCloud rivers. Riffle sculpin are found exclusively in permanent coldwater streams. This species spawns at the end of their second year, in February, March and April (Moyle et al. 2015). Adults spawn under rocks in swift riffles or inside cavities in submerged logs. Riffle sculpin feed mainly on benthic invertebrates, primarily active insect larvae. Riffle sculpin are known to be present in the project reach of Antelope Creek (M. Johnson pers. comm.). Riffle sculpin were not observed during TES site surveys, however intensive fish surveys were not conducted.

Pacific Lamprey

The Pacific lamprey is designated as a CDFW Species of Special Concern. It is reported that Pacific lamprey face numerous threats including, but not limited to reduction in prey abundance, due to stressors such as dams, diversions, habitat degradation and over-exploitation (Moyle et al. 2015). Pacific lamprey spend three to four years in the ocean before migrating, sometimes considerable distances, to freshwater streams mainly from March to late June (Moyle et al. 2015). They are believed to migrate in July in northern streams and in August and September in the Trinity River and can travel approximately 1.2 miles per day (Moyle et al. 2015). Pacific lamprey usually spawn in shallow depressions in low-gradient riffles, however nests have been observed in approximately five feet of water in Deer Creek (Moyle et al. 2015). Both adults usually die after spawning and embryos hatch after 19 days in temperatures of 15°C / 59°F (Moyle et al. 2015). After hatching, ammocoetes (juveniles) stay in the nest briefly and are then washed downstream where they burrow into soft stream sediments and filter feed for the next five to seven years until metamorphosis (Moyle et al. 2015). Once ammocoetes transform to adults and begin to tolerate salt water, they begin their downstream migrations in high flow events during the winter and spring (Moyle et al. 2015). Adults feed on body fluids of salmon, flatfishes and marine mammals larger than themselves during their oceanic existence (Moyle et al. 2015). Adult Pacific lamprey are known to migrate through and spawn near the project area and juveniles are known to rear within the project area (M. Johnson pers. comm., P. Bratcher pers. comm.). Pacific lamprey were not observed during TES site surveys, however intensive fish surveys were not conducted.

Hardhead

The hardhead is a CDFW Species of Special Concern. This species inhabits undisturbed mid- to low- elevation streams that have clear, deep pools with sand, gravel and boulder substrates and low water velocities (Moyle et al. 2015). Threats to the species include loss of habitat from changes in stream flows and temperature regimes, elimination of habitat due to dams, and predation by non-native fish species (Moyle et al. 2015). In the Sacramento River system, they are widely distributed in most of the larger tributaries as well as the river. Adult and juvenile hardhead are known to occur within the project area (M. Johnson pers. comm.). Hardhead were not observed during TES site surveys, however intensive fish surveys were not conducted.

Central Valley Steelhead

The Central Valley steelhead Distinct Population Segment (DPS) was listed as Threatened by NMFS on May 18, 1998 and February 6, 2006. CH was designated by NMFS on September 2, 2005. EFH has not been designated by NMFS. Population declines are attributed to blockage from upstream habitats, entrainment from unscreened diversions, hatchery practices and degraded habitat conditions due to water development and land use practices. Steelhead are generally distributed from southern California to the Aleutian Islands. In the Central Valley, naturally producing populations occur in the Sacramento River and its tributaries.

Steelhead stocks in the Central Valley are considered winter-run steelhead (McEwan and Jackson 1996). Central Valley steelhead adult migration occurs from October through February. Spawning occurs from December through April in streams with cool, year-round, well-oxygenated water. Incubation generally occurs from December through April. Emigration occurs in the spring and early summer as one-year-old fish. The project area is located in the currently designated CH for Central Valley steelhead. They are known to occur within the project reach of Antelope Creek and are known to migrate through, and spawn upstream of the project site (M. Johnson pers. comm.). Juvenile steelhead are also known to use the project reach of Antelope Creek for rearing and emigration and have been rescued from both of the ditches (M. Johnson pers. comm.). Rainbow trout / steelhead were observed during TES site surveys.

Central Valley Fall- / Late Fall-run Chinook Salmon

The Central Valley fall-run and late fall-run Chinook salmon are designated as a NMFS Species of Concern and as a CDFW Species of Special Concern. EFH was designated by NMFS on June 28, 2005. Population declines are attributed primarily to overfishing, unscreened diversions, and stream spawning and rearing habitat degradation. Central Valley fall-run Chinook salmon adult migration occurs in the Sacramento River from July through December. The peak of spawning occurs in October and November, incubation occurs from October through March, and rearing and emigration occurs from January through June. A majority of juvenile fish out-migrate within the first few months after emergence, but a small number remain in freshwater and out-migrate the following year. Central Valley late fall-run Chinook salmon overlap the fall-run spawning migration and enter the Sacramento River from mid-October through mid-April. Spawning occurs in the Sacramento River and tributaries from January through mid-April, incubation occurs from January through June, and rearing and emigration occurs from April through mid-December. The project area is located in the currently designated EFH for Central Valley fall- / late fall-run Chinook salmon. They are known to occur in Antelope Creek and New Creek within the project site and are also known to migrate through and spawn downstream and upstream of the project site (M. Johnson pers. comm.). Juveniles are known to use the project area for rearing (M. Johnson pers. comm.). Central Valley fall- / late fall-run Chinook salmon were not observed during TES site surveys, however unidentified juvenile salmonids were observed, which could potentially have been fall- / late fall-run Chinook salmon.

Central Valley Spring-run Chinook Salmon

The Central Valley spring-run Chinook salmon was listed as Threatened by the State of California on February 5, 1999. NMFS listed the Central Valley spring-run Chinook salmon Evolutionary Significant Unit (ESU) as Threatened on September 16, 1999. CH was designated by NMFS on January 2, 2005. EFH was designated for Pacific salmon, which includes this ESU, by NMFS on June 28, 2005. Population declines are attributed primarily to altered stream flows and blocked access to upper elevation headwaters due to dams. Spring-run Chinook salmon are thought, by some, to once have been the most abundant run of salmon in the Central Valley. This race once migrated into the headwaters of tributaries to the Sacramento and San Joaquin Rivers. They now only exist in the mainstem and a few tributaries to the Sacramento River. Central Valley spring-run Chinook salmon adult migration occurs in the Sacramento River from late March to September. The fish oversummer in coldwater habitats and then spawn from August to October with peak spawning occurring in September. Incubation occurs from mid-August to mid-March with rearing and emigration occurring from mid-August through April. Antelope Creek is one of the few tributaries to the Sacramento River where spring-run Chinook salmon reproduce. The project site is located in the currently designated CH and EFH for Central Valley spring-run Chinook salmon. They are known to occur within the project area reach of Antelope Creek and are also known to migrate through, and spawn upstream of the project area (M. Johnson pers. comm.). Juvenile spring-run salmon are also known to use the project area reach of Antelope Creek for rearing and emigration and have been rescued from both of the ditches (M. Johnson pers. comm.). Spring-run salmon were not observed during TES site surveys, however unidentified juvenile salmonids were observed, which could potentially have been spring-run Chinook salmon.

Central Valley Steelhead Critical Habitat

The stream reach in which the project is located is within the designated CH for Central Valley steelhead. CH for steelhead is defined as specific areas that contain PCEs and physical habitat elements essential to the conservation of the species. The inland habitat types present within the project area that are used as PCEs for steelhead include spawning habitat, freshwater habitat and freshwater migration corridors.

Central Valley Spring-run Chinook Salmon Critical Habitat

The stream reach in which the project is located is within the designated CH for Central Valley spring-run Chinook salmon. CH for spring-run salmon is defined as specific areas that contain PCEs and physical habitat elements essential to the conservation of the species. The inland habitat types present within the project area that are used as PCEs for spring-run salmon include spawning habitat, freshwater habitat and freshwater migration corridors.

Essential Fish Habitat

The proposed project is within the EFH of "Pacific Salmon". EFH occurs within the project area for spring-run salmon and fall- and late fall-run salmon. EFH has not been designated for steelhead.

No Action Alternative

Under this alternative, all existing project components would remain unchanged, which would continue to impact the ability for anadromous fish and other native species to efficiently migrate upstream and out-migrate downstream of the EDD. A fish bypass system would not be constructed so fish that become entrained in the ditches would continue to experience migration delays, stress and mortality. The scour hole near the LMMWC ditch diversion would not be filled and would continue to potentially cause fish migration delays. Under this alternative, potential injury or mortality would not occur to anadromous fish as a result of the construction activities. Beneficial impacts to Antelope Creek fish populations from improved passage to upstream areas that have favorable habitat would not occur. Improved passage for juvenile fish emigration would not occur. No modifications would occur to Central Valley steelhead CH or Central Valley spring-run Chinook salmon CH. Beneficial effects to Central Valley steelhead CH and Central Valley spring-run Chinook salmon CH as a result of improved passage would not occur. No modifications would occur to EFH. Beneficial effects to EFH as result of improved passage would not occur.

Proposed Action Alternative

Under this alternative, activities from the proposed project would potentially cause significant impacts to the following species and designated CH and EFH. Project activities that could cause significant impacts include site dewatering and rewatering activities, fish rescue operations, instream construction, water quality issues and vegetation removal.

Riffle Sculpin

Under this alternative, riffle sculpin could be harmed or killed by construction activities if they were present within the project area. This is considered a potentially significant impact. Beneficial effects to this species would occur as a result of improved upstream and downstream passage conditions for native adult and juvenile fish, including riffle sculpin.

Pacific Lamprey

Under this alternative, Pacific lamprey could be harmed or killed by construction activities if they were present within the project area. This is considered a potentially significant impact. Beneficial effects to this species would occur as a result of improved upstream and downstream passage conditions for native adult and juvenile fish, including Pacific lamprey.

Hardhead

Under this alternative, hardhead could be harmed or killed by construction activities if they were present within the project area. This is considered a potentially significant impact. Beneficial effects to this species would occur as a result of improved upstream and downstream passage conditions for native adult and juvenile fish, including hardhead.

Central Valley Steelhead

Under this alternative, potential direct effects to adult or juvenile Central Valley steelhead as a result of the proposed action include construction activities related to the modification of the LMMWC Ditch, construction of the new siphon and bypass return pipe, installation of flow control and monitoring infrastructure improvements and installation of rock scour hole repair upstream of the LMMWC Ditch headgate and include effects due to:

- Delays in migration, emigration or avoidance of habitat due to project activities,
- Exposure to accidental release of hazardous materials,
- Increased turbidity or sedimentation associated with storm water runoff
- Contact with equipment during construction, and
- Dewatering and fish rescue operations.

During Phase 1 of construction (November through March) adult steelhead are expected to immigrate and may emigrate through the project area, but are not known to spawn within the project reach of Antelope Creek (M. Johnson pers. comm.). Emigrating juvenile steelhead are expected to be present, although not at peak levels and juveniles may be rearing within the action area. Adult and juvenile spring-run salmon may also be present during this period. No instream work would occur during Phase 1 activities, so no impacts would occur due to physical contact with equipment. Fish immigrating or emigrating through the project reach could be impacted by temporary delays or habitat avoidance caused by noise, vibration and visual disturbance during the construction period. Any potential delays would be expected to be short-term due to the fact that construction would only occur for two to three months and would only occur for eight to ten hours per day, which would allow fish to migrate and emigrate during daily non-construction periods.

Potential impacts could occur if hazardous materials such as wet or powdered concrete, fuel or oil were accidentally released into aquatic habitats and came into contact with adult or juvenile fish. Potential impacts could also occur if significant increases in turbidity and / or sedimentation occurred due to storm water runoff during construction. RMPs and storm water BMPs will be implemented to minimize the potential release of hazardous materials and potential increases in turbidity and sedimentation.

If adult or juvenile steelhead and / spring-run salmon were in the ditches, upstream of the fish screens during Phase 1 of construction, potential impacts could occur when the ditches are dewatered and during any necessary fish rescue operations. These impacts will be addressed further below.

Phase 2 of construction (July through October) will occur during full diversion conditions. Antelope Creek water temperatures upstream and downstream of the EDD, as well as water temperatures in New Creek are expected to be at lethal levels for anadromous fish during most of this time if the project occurs in a normal or below-normal water year. Adult immigration could potentially occur at the end of project activities depending on fall precipitation and diversion rates while adult emigration would not be expected to occur due to the warm and low water conditions during this period. All instream work will be completed by the end of September or mid-October with CDFW and NMFS approval to minimize potential direct impacts to adult fish. Emigrating and rearing juveniles are not generally expected to be present within the action area, however they could potentially occur at the beginning and end of the construction period if suitable water temperatures were present. If fish were present, they could be harmed or killed as a result of dewatering and subsequent instream construction activities.

While unlikely, due to the possibility that adult or juvenile fish may potentially be present during the instream work, a fish rescue operation will occur during dewatering activities. A fish exclusion zone upstream and downstream of the instream construction areas, as needed, will be implemented prior to the onset of any instream construction activities. The actions necessary to remove fish out of the construction area are expected to result in some form of fish capture and handling. A permitted crew will be responsible for the seining, dip-netting, and / or electroshocking. Actions will be taken first to encourage fish to volitionally move out of the area prior to implementing other methods. If electrofishing is required, NMFS electrofishing guidelines (National Marine Fisheries Service 2000) will be used. Any capture and handling associated with electrofishing is likely to result in direct effects to juvenile steelhead rearing in the fish exclusion zone. It is expected that any capture, handling and release of the juvenile steelhead will disrupt normal behavior and cause temporary stress, injury, and occasional mortality. It is anticipated that fish capture / relocation will not last more than one to two days, however additional capture / relocation will occur over several additional days if additional fish are observed within the exclusion zone as a result of daily monitoring. The fish exclusion zone will be maintained until the construction is completed and instream turbidity has dissipated.

In creating a fish exclusion zone, a crew will herd any fish present out of the work area, and block nets will be set to keep fish from reentering the work area. To remove remaining juvenile fish, snorkeling, dip-netting, and electroshocking will be used. All captured fish will be held in buckets filled with stream water for a period only long enough to transport them to an appropriate release site upstream or downstream of the project site. Although NMFS electroshocking guidelines will be used if needed, direct effects to individual fish would likely occur.

During rewatering, a plume of turbidity and some suspended sediment is anticipated to occur in Antelope Creek and New Creek immediately following construction activities as the channels immediately begin to adjust to the new conditions. This turbidity and small amount of suspended sediment will likely persist in the water column for several hours until channel conditions stabilize, however rewatering activities will occur slowly, in order to minimize turbid conditions in Antelope Creek and New Creek. Turbidity and settleable matter are not expected to exceed the likely conditions in the Clean Water Act Section 401 Certification issued by the RWQCB. If juvenile steelhead are present in the immediate area downstream, it is believed that the number of fish affected will be few and most will volitionally leave the area until activities cease or turbidity diminishes. Juvenile fish should be able to escape to available refugia near the area, a non-lethal behavioral response. Because the work will occur downstream of the known steelhead and spring-run salmon spawning areas, no redds are expected to be affected.

During the initial time period following construction and the initial winter, sediment disturbed by project construction activities will likely be redistributed by high flows, along with associated turbidity in Antelope Creek and New Creek. Because the anticipated amount of sediment is small, and mobilization will occur during high flows of the initial winter (when background turbidity and sediment transport is relatively high), only minimal affects to adult or juvenile steelhead are anticipated.

As a result of construction activities, some of the riparian habitat along the stream channels and banks of Antelope and New Creeks will be removed. It is estimated that approximately 0.24 acres of riparian habitat will be disturbed along New Creek and Antelope Creek as a result of the construction related project activities. This will result in a temporary reduction of shaded aquatic habitat. To minimize this effect, riparian vegetation will be replanted as detailed in the RMPs outlined earlier in this document and the revegetation plan to be prepared for this project.

Impacts could occur if steelhead were present within the project area and were harmed or killed by project construction activities. This is considered a potentially significant impact. Beneficial effects to this species would occur as a result of improved upstream and downstream passage conditions for native adult and juvenile fish, including Central Valley steelhead.

Central Valley Fall- / Late Fall-run Chinook Salmon

Under this alternative, the impacts to fall- / late fall-run salmon are expected to be similar to the impacts listed for steelhead. This is considered a potentially significant impact. Beneficial effects to this species would occur as a result of improved upstream and downstream passage conditions for native adult and juvenile fish, including Central Valley fall- late fall-run Chinook salmon.

Central Valley Spring-run Chinook Salmon

Under this alternative, the impacts to spring-run salmon are expected to be similar to the impacts listed for steelhead. This is considered a potentially significant impact. Beneficial effects to this species would occur as a result of improved upstream and downstream passage conditions for native adult and juvenile fish, including Central Valley spring-run Chinook salmon.

Central Valley Steelhead Critical Habitat

Under this alternative, while there would be changes to the habitat that currently exists within the project sites as a result of construction of the proposed project, no net loss of CH would be expected as a result of project implementation. Turbidity generated by construction activities could have an effect on the CH elements that address water quality, however the impact to this element is considered very minimal because 1) the impact is considered very small in quantity; and 2) the project would improve access for fish to upstream and downstream habitats. As a result of some streamside vegetation removal, there would be a reduction of shaded aquatic habitat. To minimize this effect, vegetation would be replanted as detailed in the RPMs outlined in Appendix F, and the revegetation plan to be prepared for this project. Given the temporary nature of project construction, the risk of short-term impacts is relatively low, compared to the long-term benefits of improved fish passage that the proposed project would provide. This is considered a less than significant impact. Beneficial impacts would occur by enhancing all three PCEs including spawning habitat, freshwater rearing habitat and freshwater migration corridors. An ESA consultation will occur with NMFS to address potential impacts to Central Valley Steelhead CH.

Central Valley Spring-run Chinook Salmon Critical Habitat

Under this alternative, the impacts to Central Valley spring-run Chinook salmon CH are expected to be similar to the impacts described above for Central Valley steelhead CH, including beneficial impacts. This is considered a less than significant impact.

Essential Fish Habitat

Under this alternative, no net loss of EFH is expected as a result of project implementation. The effects would be expected to be similar to the effects described under the Central Valley Steelhead CH section above, including beneficial impacts. This is considered a less than significant impact.

The following measures would be implemented to avoid and minimize impacts to fisheries and to mitigate potentially significant impacts to fisheries to less than significant levels:

FISH-1: The National Marine Fisheries Service (NMFS) shall be consulted to 1) develop appropriate avoidance and minimization measures, and 2) determine whether an Endangered Species Act Section 7 take permit will be required for the project. All protective measures imposed by NMFS through the consultation process shall be adhered to.

FISH-2: Instream work can occur between July 1 and September 30. Instream work could start sooner if the California Department of Fish and Wildlife (CDFW) determines that the adult CV spring-run Chinook salmon are no longer present based on environmental conditions and real time passage data. Instream work could be extended to October 14, if environmental conditions which would preclude juvenile steelhead and spring-run Chinook salmon emigration or adult steelhead and late fall-run Chinook salmon immigration are expected to persist. Instream work outside of the July 1 to September 30 work window

must be approved by CDFW and NMFS on a case-by-case basis with details on how take will be avoided and / or minimized.

FISH-3: All construction debris (concrete, metal etc.) from the fish passage improvement-related construction activities will be removed from the active stream channel post-construction.

FISH-4: Immediately prior to instream work, a qualified fish biologist, in coordination with CDFW, will conduct surveys above and below the area to be dewatered, to identify presence of salmonids. The Resource Conservation District of Tehama County (RCDTC), in coordination with the contractor, and in consultation with NMFS and CDFW, will ensure that qualified fish biologists are onsite to implement fish rescue operations within the dewatered area through the use of herding, seining and / or electrofishing, if necessary. Best professional determination will be used to decide which method(s) of rescue is to be used and where the relocation of captured fish, either upstream or downstream of the temporary dams is to occur. Biologists will first try to haze and herd fish out of the fish exclusion area. If fish biologists determine that the use of electrofishing is necessary for the efficient and successful removal of fish, NMFS electrofishing guidelines (National Marine Fisheries Service 2000) will be strictly followed. The fish rescue team will be comprised of fishery biologists with professional experience using seines and electrofishing equipment. The same methodologies will be used during dewatering of the diversion ditches.

FISH-5: All water pumps used during construction shall be screened to meet CDFW and NMFS criteria, unless deemed unnecessary by CDFW and NMFS (i.e. if water was being diverted from an off-channel pool). The refueling of pumps will occur away from the wetted area / channel. If pumps are using fuel, they will be outfitted with a spill kit.

FISH-6: All dewatering and rewatering activities will be conducted slowly, in order to minimize disturbance to fish. A qualified fisheries biologist will be onsite during these activities, and CDFW will be notified prior to these activities.

FISH-7: All reasonable measures will be taken to minimize impacts to lamprey, including spending more time at the area as it becomes dewatered (and they are moving out of the mud, chasing the water as it recedes), and possibly electroshocking.

FISH-8: Appropriate measures will be used to avoid the spread of aquatic invasive species such as zebra / quagga mussels, New Zealand mudsnails and chytrid fungus to and from the project area according to the current CDFW Aquatic Invasive Species Disinfection / Decontamination Protocols (Northern Region) and the current U.S. Fish and Wildlife Service (USFWS) Red Bluff Fish and Wildlife Office Anadromous Fish Restoration Program Hazard Analysis Critical Control Point Plan.

3.5 Cultural and Tribal Cultural Resources

3.5.1 Affected Environment

An archaeological inventory resulted in the identification of three sites located within the project area, one historical and two prehistoric; the Antelope Main Diversion Dam, a prehistoric Native American midden-mound site and a prehistoric Native American lithic scatter site (SubTerra Consulting, Archaeology and Paleontology 2017).

<u>Antelope Main Diversion Dam (Ca-Teh-2303H)</u>

In its current condition, the Antelope Main Diversion Dam is a mix of original 1912 constructed features along with later demolitions, replacements and augmentations, some of undetermined vintage. The Antelope Main Diversion Dam was built by cast-in-place, reinforced concrete construction. The dam is composed of 12 main components, ten built in 1912 and two probably built between 1912 and 1969. Only two of the features are

substantially intact from 1912. Ten of the 12 features have been demolished, modified or replaced, including recent and ongoing modifications.

Native American Midden-Mound Site (EAD-CR-1)

A prehistoric Native American midden-mound site is located on the immediate south margin of the project access Area of Potential Effect (APE). The site occupies the area of an active Edwards Ranch corral adjacent to a dirt road designated for project-related construction access. The mound area is slightly darker than surrounding soils, and is likely to be a poorly-developed midden. Intensive surface reconnaissance encountered low to moderate-density scatter of fire-cracked rock and a low-density scatter of metavolcanic flakes contained within the site boundaries. An additional seven metavolcanic flakes were encountered north of the site boundary within the APE. The weight of the evidence indicates that the dispersed flakes found north of the site boundary were transported by historical plowing and earthmoving from the adjoining archaeological deposit.

Native American Lithic Scatter Site (EAD-CR-2)

A prehistoric Native American lithic scatter site is located on the immediate west margin of the project access APE, its east border paralleling the project access road. The site is associated with the margin of a broad Antelope Creek floodplain and would have been a creek bank deposit when occupied. The site area is slightly darker than surrounding soils, and is likely to be a poorly-developed or leached midden. Intensive surface reconnaissance encountered a low to moderate-density scatter of fire-cracked rock and a low-density scatter of metavolcanic flakes contained within the site boundaries. An additional 11 prehistoric artifacts were encountered outside site boundaries in the access road APE. The artifacts included five metavolcanic spall tools, or large flakes chipped along one edge to be used as tule saws or other cutting tools; three metavolcanic core tools representing large, palm-sized water-worn pebbles chipped along one edge to make a beveled chopping or cutting tool; two metavolcanic flakes representing products from tool manufacture and use, and; one flat millingstone fragment. The weight of the evidence indicates that the dispersed flakes found east of the site boundary were transported by historical plowing from the nearby archaeological deposit.

3.5.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

The assessment of potential impacts of the proposed project on cultural resources is based on a review of databases and pertinent literature and field studies. A document review was conducted at the Northeast Information Center of the California Historical Resources Information System, California State University, Chico. In addition to consulting a number of primary and secondary archaeological sources, a field survey took place on November 12, 2018 and February 2, 2019 by Dr. Gregory White of Sub Terra Consulting, Archaeology and Paleontology (Sub Terra). The entire APE was covered. When archaeological materials were identified, coverage was expanded to define resource boundaries. All survey followed an intensive survey strategy consisting of pedestrian transects spaced between three and six meters apart (10–20 feet). The access components of the APE included an open dirt road bordered by a freshly tilled field and partially graveled areas at the south end. Where dense grass or leafy debris prevented ready visibility, survey was augmented by surface scrapes using a trowel and hoe. On February 2, 2019, eight augers were dug in order to determine the potential for subsurface cultural resources in the portions of the APE adjacent to cultural resources. Augering was completed using an AMS © manual drive, carbon steel, 4-inch barrel auger with extensions to reach 10.5 feet (320 centimeters). Each auger was dug in measured depth intervals, and the spoils from each interval were placed in order by depth on an 8-x-12 foot drop cloth laid out alongside the auger hole. The spoils were carefully inspected for cultural material. Notes were taken on depth below surface and the texture, hardness, plasticity, grain, and structure of soils. Artifacts were identified, illustrated, and tallied and re-buried in the auger hole. GPS data-logging was accomplished using a high-resolution SX

Blue II GNSS© series GPS receiver linked via Bluetooth© to a Samsung S3 Tablet© running the Mapit© app for Android©. Photo-documentation was accomplished using the S3 digital camera, and georeferenced using the Mapit© app. Resources were recorded using California Department of Parks and Recreation site record forms (Cal DPR-523a-l) according to standards described in "*Instructions for Recording Historical Resources*" (California Office of Historic Preservation 1993). All artifacts identified during the survey were left in place.

Native American Coordination

Work reported here was carried out in conformance with 54 U.S.C. Section 302706, which requires federal agencies and entities operating under federal permits or funding, in carrying out their responsibilities of the National Historic Preservation Act (NHPA) Section 106, to consult with any Indian tribe that attaches religious and cultural significance to historic properties that may be affected by an undertaking. In order to address this mandate, Sub Terra contacted the State of California, Native American Heritage Commission (NAHC) to request a Sacred Lands Inventory for the proposed project area. NAHC responded to the Sacred Lands Inventory request on June 4, 2018, indicating that NAHC files contain no listing for sacred lands in the vicinity of the proposed project. The NAHC response also included a list of six additional recommended tribal contacts. Letters containing a project description and map location were sent to the six on June 16, 2018. No response has been received as of the preparation of this document.

The project would have a significant impact if it would:

a. Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5;

b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5;

c. Disturb any human remains, including those interred outside of formal cemeteries; or

d. 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:

    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

    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.

No Action Alternative

Under this alternative, no impacts or changes would occur to existing cultural resources which were identified and evaluated in the project area. The identified cultural resources, including the Antelope Main Diversion Dam (Ca-Teh-2303H), the Native American Midden-Mound Site (EAD-CR-1) and the Native American Lithic Scatter Site (EAD-CR-2) would remain unchanged.

Proposed Action Alternative

<u>Antelope Main Diversion Dam (Ca-Teh-2303H)</u>

The proposed Project APE is confined to three Ca-Teh-2303H features, the West (Edwards) Ditch Headworks, the East (LMMWC) Ditch Headworks, and the Antelope Creek West Bank Levee.

West Ditch Headworks

Current engineering plans call for in-place abandonment of a 400-foot (122 meter) section of the West Ditch Headworks from the West Ditch headgate to a location immediately south of the existing fish screen-scrubber box. Identification efforts discussed above documented prior demolition and replacement of the entire West

Ditch headworks south of the West Ditch Headgate in the 1970s–1990s, resulting in complete removal of the original 1912 earthen-berm ditch features. Therefore, a finding of "No Historic Properties Affected" pursuant to 36 CFR Part 800.4(d)(1) is determined for this portion of the proposed undertaking. As such, there would be no substantial adverse change in a significant historical or archaeological resource or destruction of any unique paleontological resource. Any impacts to the West Ditch Headworks would be less than significant.

East Ditch Headworks

The East Ditch Headworks may be improved to reduce leakage. Other construction components include instillation of a new fish screen and scrubber, installation of a new siphon pipe to connect to the existing West Ditch, and installation of a new juvenile fish return pipe to Antelope Creek. These alterations in their totality will result in alternation and / or complete demolition and replacement of the existing East Ditch headworks. Identification efforts discussed above documented prior demolition and replacement of the entire East Ditch headworks south of the East Ditch Headgate in the 1970s–1990s, resulting in complete removal of the original 1912 ditch features. Therefore, a finding of "No Historic Properties Affected" pursuant to 36 CFR Part 800.4(d)(1) is determined for this portion of the proposed undertaking. As such, there would be no substantial adverse change in a significant historical or archaeological resource or destruction of any unique paleontological resource. Any impacts to the East Ditch Headworks would be less than significant.

Antelope Creek West Bank Levee

Installation of the new East Ditch-to-Antelope Creek juvenile return pipe will result in excavation of a 40-foot wide section of the Antelope Creek west bank levee originally installed in 1912 in conjunction with construction of the Edwards-Antelope Creek Diversion. At the present time planning has not advanced sufficient to determine if the levee mass will be replaced after installation. Identification efforts discussed above documented evidence of ongoing augmentation and modification of the levee feature resulting in elimination of the original 1912 levee features. Therefore, a finding of "*No Adverse Effect*" pursuant 36 CFR Part 800.4(d)(1) is determined for this portion of the proposed undertaking. As such, there would be no substantial adverse change in a significant historical or archaeological resource or destruction of any unique paleontological resource. Any impacts to the Antelope Creek West Bank Levee would be less than significant.

Native American Midden-Mound Site (EAD-CR-1)

Prehistoric Native American midden-mound site EAD-CR-1 is located immediately adjacent to the proposed project Access APE. Intensive field investigation including surface survey and Phase 1.5 subsurface probes found a dispersed scatter of metavolcanic flakes contained in the APE, but these materials were extremely low-density (seven flakes in 1,750 square meters, or one flake per 250 square meters) falling well below the conventional definition of a site, therefore these artifacts represent isolated finds. Further, the finds were associated with a disturbed surface alluvium and were determined likely to have been transported by plow drag. Therefore, a finding of "No Historic Properties Affected" pursuant to 36 CFR Part 800.4(d)(1) s determined for this portion of the proposed undertaking. As such, there would be no substantial adverse change in a significant historical or archaeological resource or destruction of any unique paleontological resource. This is considered a less than significant impact. However, any inadvertent impacts outside of the project site, within the prehistoric site would be considered a potentially significant impact.

Native American Lithic Scatter Site (EAD-CR-2)

Prehistoric Native American lithic scatter site EAD-CR-2 is also located immediately adjacent to the proposed Project Access APE. Intensive field investigation including surface survey and Phase 1.5 subsurface probes found a dispersed scatter of stone tools contained in the access APE, but these materials were very low-density (11 artifacts in 1,325 square meters, or one artifact per 120 square meters) falling below the conventional definition of a site, therefore these artifacts represent isolated finds. Further, the finds were associated with a disturbed surface alluvium and were determined likely to have been transported by plow drag. Therefore, a finding of "No Historic Properties Affected" pursuant to 36 CFR Part 800.4(d)(1) s

determined for this portion of the proposed undertaking. As such, there would be no substantial adverse change in a significant historical or archaeological resource or destruction of any unique paleontological resource. This is considered a less than significant impact. However, any inadvertent impacts outside of the project site, within the prehistoric site would be considered a potentially significant impact.

No known archaeological or cultural sites were identified from the local tribal groups contacted by SubTerra. No known human remains will be disturbed within the project area however unknown subsurface cultural resources could be impacted during ground-disturbing activities associated with the proposed project. This is considered a potentially significant impact.

The following measure would be implemented to avoid and minimize impacts to cultural and tribal cultural resources and to mitigate potentially significant impacts to cultural and tribal cultural resources to less than significant levels:

CULTURAL-1: Cultural resource site EAD-CR-1 shall be considered environmentally sensitive and no use or modification of the site shall occur. Prior to the onset of construction, the boundary of the site shall be marked with high-visibility fencing and / or flagging and the need to avoid disturbance of the site shall be included in the environmental awareness training for project personnel.

CULTURAL-2: Cultural resource site EAD-CR-2 shall be considered environmentally sensitive and no use or modification of the site shall occur. Use and modification of the existing roadbed adjacent to the site may occur but shall be confined to the existing road footprint not to extend more than 15 feet on either side of the existing road centerline. Prior to the onset of construction, the 15 foot buffer shall be marked with high-visibility fencing and / or flagging and the need to avoid disturbance of the site shall be included in the environmental awareness training for project personnel.

CULTURAL-3: In the event subsurface archaeological resources are encountered during ground-disturbing activities, all work will cease at the general area of discovery and the USFWS regional archaeologist, or other lead agency archaeologist, will be notified immediately. A field exam by a professional archaeologist may be required and further steps for resource protection will be implemented, including mitigation and consultation with the Native American Indian community if human remains are encountered (following Native American Graves Protection and Repatriation Act procedures). Work may proceed on other parts of the project site while mitigation for historical, unique archaeological or tribal resources is being carried out.

3.6 Energy

3.6.1 Affected Environment

In order to address the California Air Resources Board's 2017 Scoping Plan goals, a project's energy use must be analyzed, including the energy used during construction. Implementation of the proposed project would result in the use of fossil fuels, a nonrenewable form of energy for construction activities. Construction would occur over a three-month period. Operations at the project site would basically remain the same after construction is finished.

3.6.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

The energy analysis is based on VMT from Transportation Section 3.17 and the Final Statement of Reasons for Regulatory Action, Amendments to the State CEQA Guidelines OAL Notice File No. Z-2018-0116-12.

An impact related to energy would be significant if the project would:

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation; or
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

No Action Alternative

Under this alternative, no construction activities would occur and thus there would be no impact on energy because the project would not be implemented.

Proposed Action Alternative

The project would generate a total of 371 vehicle and truck trips over a three-month period, plus a 5,500-watt generator would be utilized for 15 days, operating for eight hours per day. Six truck trips would occur for mobilization / demobilization of equipment. Therefore, a total average of 6.1 trips would occur per day.

Tehama County has not yet developed thresholds for the newly adopted CEQA guidelines, however, the Governor's Office of Planning and Research recommends in their Technical Advisory to look at VMT when considering energy use from construction and operations (Governor's Office of Planning and Research, State of California 2018). For small projects that result in fewer than 110 trips per day, it is generally assumed that a less than significant transportation impact would occur. There would be no potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources and the project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Even with the generator use, impacts from construction would be less than significant.

When considering the future required trips that will occur under the Operations and Maintenance Agreement between the Edwards Ranch, LMMWC, CDFW, USFWS and NMFS, the recommended VMT threshold would still not be reached. Therefore long-term impacts from operations would be less than significant.

3.7 Environmental Justice

3.7.1 Affected Environment

On February 11, 1994, President Clinton issued Executive Order 12898, "Federal actions to Address Environmental Justice in Minority and Low-Income Populations." Environmental justice refers to "nondiscrimination in federal programs substantially affecting human health and the environment" and "providing minority communities and low income communities access to public information on, and an opportunity for public participation in, matters relating to human health or the environment". In particular, it involves preventing minority and low-income communities from being subjected to disproportionately high and adverse environmental effects of federal actions. In complying with NEPA, federal agencies are required to consider human health, economic, and social impacts of the proposed project on minority and low-income communities.

The majority (estimated at 86 percent) of Tehama County's population was Caucasian (U.S. Census Bureau 2017 American Community Survey). Minorities of African American, American Indian, Alaska Native, Asian, Native Hawaiian or other Pacific Islander, Hispanic and Latino ethnicities comprises the remaining 14 percent of the county's population. Per capita annual income for Tehama County in 2015 was $22,263, which is below the California state average of $30,318 (U.S. Census Bureau 2017). Tehama County's preliminary unemployment rate (not seasonally adjusted) in June 2019 was 5.7 percent (U.S. Department of Labor 2019). There are two residences associated with the Edwards Ranch located in the vicinity of the project.

3.7.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

Because environmental justice is not a CEQA issue, specific significance criteria were not applied in evaluating potential environmental justice consequences. Instead, any modification or change in environmental justice factors which would occur in response to the proposed action is evaluated in accordance with NEPA requirements. Incorporation of environmental justice principles throughout the planning and decision-making processes implements the principles of NEPA, Title VI of the Civil Rights Act, and the Uniform Relocation Act.

No Action Alternative

Under this alternative, no direct impact to a minority or low-income population or community would take place because the project would not be implemented. Therefore, there would be no impact.

Proposed Action Alternative

Under this alternative, the proposed project would result in fish passage improvements at the EDD. The water conveyance system would continue to convey water to LMMWC customers and for agricultural uses on Edwards Ranch. Minority and low-income residents live in the general vicinity of the project area however there is no evidence to suggest which the project would cause a disproportionately high adverse human health or environmental effect on minority and low-income populations compared to other residents of the area. The known health risks to residents which could be associated with the project are evaluated in the sections of this document related to water quality, air quality, hazardous materials, noise and transportation. For the most part, these health risks are associated with the construction aspects of the project, in which residents could be exposed to hazardous materials which may be associated with the project. The project would be managed through RPMs to minimize these risks, and also as required by applicable federal and state safety regulations. The proposed project's potential effects on environmental justice would be negligible, because it would have no significant unmitigatable impacts, and would be a relatively small, short-term project with no negative effect on any minority or low-income population.

3.8 Greenhouse Gas Emissions

3.8.1 Affected Environment

Along with natural causes, increases in GHG emissions occur through burning coal, natural gas, oil, and gasoline. The CARB is the state agency responsible for monitoring and regulating sources of GHG emissions. GHG emissions may include carbon dioxide (CO_2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Regional sources of GHG emissions in the project area vicinity include traffic along State Route (SR) 99 East, Hogsback Road, Cone Grove Road and other local roadways; electricity generation; and stationary sources from various commercial and industrial properties.

3.8.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

GHG Inventory worksheets were used to estimate CO_2 equivalencies based on construction equipment and estimated operation days required for the proposed project. The data were used to analyze the impacts, context and intensity of the proposed action and the no-action alternative on GHG emissions and determine the need for mitigation measures to reduce or offset impacts.

The project would have a significant impact if it would:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

No Action Alternative

Under this alternative, no construction activities would take place in the project area, therefore no construction-related GHG would be produced.

Proposed Action Alternative

Under this alternative, it is estimated that construction activities associated with the proposed action would generate an estimated 39 metric tons of CO_2 equivalencies over the construction period. Within the project area, the types of construction equipment that will be used and the calculated CO_2 equivalencies are shown in Appendix H. While project construction activities and vehicular travel to and from the work sites by employees would result in GHG emissions, the exhaust from construction activities and vehicle traffic would be a temporary single source of GHG generated by the proposed project over pre-project conditions. The nature of the proposed project is not indicative of potential long-term increases in greenhouse gases. The estimated 39 metric tons of CO_2 increase due to construction activities would be short-term and would not exceed the 25,000 metric tons of CO_2-equivalent GHG emissions' threshold based on NEPA guidance and would have a less then significant impact on the environment.

GHG emissions would not be cumulatively significant considering the amount of GHG emissions generated by the project. The proposed project is consistent with the USFWS goals and objectives, including the promotion of habitat connectivity and integrity (U.S. Fish and Wildlife Service 2010). The proposed action would facilitate the movement of native fish species.

The State of California has adopted several regulations related to GHG emissions reduction (California Air Resources Board 2012). These include efforts to reduce tailpipe emissions and diesel exhaust produced by fuel-combustion engines. Project operations would adhere to statewide efforts aimed at minimizing GHG emissions. As such, the proposed project would not conflict with any identified plans adopted for the purposes of reducing GHG emissions and would result in less than significant impacts.

3.9 Hazards and Hazardous Materials

3.9.1 Affected Environment

Hazardous materials management involves the prevention of illegal hazardous materials actions on public lands; the proper authorization, permitting, and regulation of the uses of hazardous materials; and the timely, efficient, and safe responses to hazardous materials incidences. Federal, state, and local agencies regulate hazardous materials and hazardous waste. Nonetheless, illegal storage and disposal and unintentional releases of hazardous materials or waste from leaks and accidents can occur when hazardous materials are used or hazardous waste is generated by a project.

Under the California Code of Regulations (CCR), Title 13, Section 1150-1194, and CFR Title 49, the California Highway Patrol (CHP) regulates the transport of hazardous materials. When a spill of hazardous material or waste occurs on a highway, such as SR 99 East, the CHP is responsible for directing cleanup and enforcement (CCR Section 2450-2453b).

There are no public airports or private airstrips near the project site. The closest airport is located approximately seven miles to the southwest. The project is also not located near a school, the closest school

is located approximately over three miles to the west of the project site. The project site is located within an area which borders the designations of "(Non-Very High / Moderate) Fire Hazard Severity Zones" on the Tehama County Fire Hazard Severity Zone map (California Department of Forestry and Fire Protection 2019). A governmental record search (California Department of Toxic Substances Control. 2019) indicated which there are no known hazardous waste and substances sites located within five miles of the project site.

3.9.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

The hazards and hazardous materials analysis is based upon a review of a governmental record search of the DTSC EnviroStor database (California Department of Toxic Substances Control 2019).

An impact related to hazards and hazardous materials would be significant if the project would:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment;
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, the project would result in a safety hazard or excessive noise for people residing or working in the project area;
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

No Action Alternative

Under this alternative, no construction activities would occur and thus there would be no risk of hazard to the public through the transport, use or disposal of hazardous materials, nor would this alternative interfere with emergency response and evacuation plans. This alternative would not result in an airport safety hazard. Similarly, there would be no impact on wildland fire potential or catastrophic fire behavior because the project would not be implemented.

Proposed Action Alternative

Under this alternative, activities associated with the proposed project would utilize potentially hazardous materials associated with the project construction and operation of vehicles and construction equipment during project implementation including oil, fuels and concrete. These materials are similar to those routinely used for other types of construction projects throughout Tehama County. The widespread use and associated transport of these materials along the highways and county roads which traverse Tehama County, combined with the low level of incidents (spills), suggest which impacts related to project activities would be similar to those found elsewhere in the county. Given the temporary nature of project construction, the risk of hazardous materials spills is relatively low; however, the potential release of these hazardous materials is considered a potentially significant impact.

This project would not emit hazardous emissions or require handling of hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school. The project is not

located on a site included on a list of hazardous materials sites which would create a significant hazard to the public or the environment, nor is it located within two miles of a public or private airport or airstrip.

Under the proposed project, construction traffic would include the trucks traveling to and from the site over the course of the construction period. Construction traffic would be limited to daily trips for personnel and routine service and supply vehicles. Accessing the project area would not impede emergency response and evacuation plans. The impacts created would be less than significant.

Construction activities are a potential source of wildfire ignition. The vegetation in the project area is composed of a fire-adapted vegetation community and is susceptible to wildfire, however the project area is located in an area designated as a "Non-Very High Fire Hazard Severity Zone". Under the proposed project, construction activities would occur within, or adjacent to the riparian corridor of Antelope Creek, New Creek and both ditches. Potential fuels within the boundaries of the site are generally noncontiguous and the creek serves as a substantial natural firebreak. The types and amounts of fuels and their continuity may be decreased temporarily by implementation of this alternative, particularly in areas subject to vegetation removal, but any such changes would not be significant with respect to fire potential and behavior. In the long-term, potential fire conditions would be similar to those which currently exist and not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires. The proposed project would have a less than significant impact on wildland fire potential and behavior.

The following measures would be implemented to avoid and minimize impacts related to hazards and hazardous materials and to mitigate potentially significant impacts related to hazards and hazardous materials to less than significant levels:

HAZ-1: A designated concrete washout area will be located at least 100 feet from any high water mark within adjacent waterways, and from any wetlands and will be developed and used following the U.S. Environmental Protection Agency Storm Water BMP for a Concrete Washout.

HAZ-2: BMPs will be developed and implemented to ensure that wet concrete and concrete grindings do not enter Antelope Creek, New Creek, wetlands or other aquatic sites during construction.

HAZ-3: Measures WATER-3 through WATER-5 associated with potential petroleum product spills will be fully implemented.

HAZ-4: Construction equipment and materials shall not be stored or stockpiled in the creek channel, and shall be stored at least 50 feet from the top of the stream bank, any wetlands or other aquatic sites.

3.10 Hydrology and Water Quality

3.10.1 Affected Environment

The project site is located within the Antelope Creek watershed. Antelope Creek is a perennial stream originating from Turner Mountain in the Lassen National Forest, and eventually flowing into the Sacramento River. The Antelope Creek watershed includes a total area of 123 square miles. An intermittent stream (New Creek) is also present within the project site. There are also two ditches that divert water from Antelope Creek through the project area for agricultural purposes.

Water Quality

Antelope Creek's water quality is influenced by sediment loads coming from erosion of the rhyolitic soils in the upper watershed and potentially from land management activities in the watershed, including timber harvesting, wildfire, roads, cattle grazing and urbanization, however the contribution of these sources to the overall condition of water quality is unknown.

A water quality study was conducted for Antelope Creek in 2013 (Stillwater Sciences and Resource Conservation District of Tehama County 2015). Water quality data were collected at five monitoring sites in Antelope Creek in June and September of 2013 at several monitoring sites upstream and downstream of EDD. A number of water quality parameters were measured, including pH, ammonia, dissolved oxygen, hydrogen sulfide and temperature. Measurements were taken during the 2013 water year, which was considered a dry water year according to the Sacramento Valley Water Year Type Index (California Department of Water Resources 2016).

One parameter measured during this effort was pH. The Water Quality Control Plan for the region (Basin Plan), states which pH of waters shall not fall below 6.5 nor raise above 8.5 at any time (California Regional Water Quality Control Board Central Valley Region 2016). Elevated pH levels were observed in Antelope Creek during both June and September (Stillwater Sciences and Resource Conservation District of Tehama County 2015).

Ammonia was also measured during the 2013 water quality monitoring effort. The Basin Plan does not include a numeric criterion for ammonia toxicity, however the U.S. EPA recommends a one-hour-average Criterion Maximum Concentration (CMC) and a three day rolling average Criterion Continuous Concentration (CCC) for freshwater aquatic biota (U.S. Environmental Protection Agency 2013). According to the results of the pH and stream temperatures measured and the grab samples collected, the total ammonia CMC and CCC values for June and September 2013 indicated little to no potential for ammonia toxicity to fish in Antelope Creek (Stillwater Sciences and Resource Conservation District of Tehama County 2015).

Dissolved oxygen (DO) was another parameter measured during the 2013 water quality monitoring effort. The Basin Plan states which DO concentrations shall not be reduced below 5.0 milligrams (mg) / liter (L) to protect existing warm freshwater habitat and 7.0 mg / L to protect existing cold freshwater habitat, as well as spawning, reproduction, and / or early development (California Regional Water Quality Control Board Central Valley Region 2016). Overall, 2013 monitoring results indicated that lower Antelope Creek does not consistently support the cold freshwater habitat designated beneficial use with respect to DO concentrations during spring and late summer / early fall and low DO concentrations in the evening and early morning hours suggest intense respiration by aquatic organisms (Stillwater Sciences and Resource Conservation District of Tehama County 2015). Diurnal decreases in dissolved oxygen during June and September could result in potential effects on migrating adult and emigrating juvenile spring-run Chinook and emigrating juvenile steelhead (Stillwater Sciences 2014).

Hydrogen sulfide was also measured in the 2013 monitoring efforts. Acute toxicity to fish has a range from 14.9 micrograms (ug) / L for fathead minnow to 44.8 ug / L for bluegill (76 FR 64022). While there is no national recommended water quality CMC for freshwater aquatic life for dissolved hydrogen sulfide (U.S. Environmental Protection Agency 1986), the national recommended water quality CCC for freshwater aquatic life is 2.0 ug / L (U.S. Environmental Protection Agency 1986). Approximately 80 percent of the dissolved sulfide measurements taken in 2013 were below 10 ug / L and most of the remaining 20% of measurements were between 10 ug / L and 20 ug / L. It is not possible to determine if the recommended CCC of 2.0 ug / L was exceeded, however the results suggest, in particular at one sample site in Antelope downstream of the EDD that dissolved sulfide concentrations were at toxic levels for fish in June and September 2013 (Stillwater Sciences 2014).

Water temperature in Antelope Creek is an important parameter for species such as spring- and fall-run Chinook salmon, trout and steelhead. Elevated water temperatures were observed on a seasonal and diurnal basis in lower Antelope Creek during the 2013 water quality monitoring efforts (Stillwater Sciences 2014). In 2013, the highest water temperatures occurred during the months of June and July while the number of days that mean daily water temperatures exceeded potential lethal and sublethal thresholds for salmonids was greatest in July and August (Stillwater Sciences 2014). See Section 3.4.11, Fisheries for more information on

water temperatures within Antelope Creek. The elevated water temperatures during May and October of 2013 had potential for short- and long-term effects on migrating adult and emigrating juvenile spring-run Chinook and emigrating juvenile steelhead throughout the lower mainstem Antelope Creek and the New Creek, Craig Creek and Antelope Creek distributaries (Stillwater Sciences 2014).

Mercury is a water quality concern in watersheds with significant mining histories. Mercury is typically attached to particulate matter and has the ability to adsorb (hold as a thin film on the outside surface of a material) to fine sediments with high organic matter. Mining was not an important activity historically and has not been in recent times within the Antelope Creek watershed. Historic sources mention inconsequential placer mining taking place on homesteads located adjacent to Antelope Creek, however, no significant mining ventures or mineral deposits have been noted in the Antelope Creek watershed, as highlighted by the total lack of mineral locations on a 1946 "*Tehama County Mineral Location Map*" (Armentrout et al. 1998).

Groundwater Quality

The project site is located within the Sacramento Valley Groundwater Basin (SVGB) in the Antelope subbasin. The Antelope subbasin is bounded on the east by Antelope Creek, on the south and west by the Sacramento River and on the north by the low permeability mudflow deposits of the Tuscan Formation from Mount Lassen. Groundwater in the SVGB is typically sufficient for municipal, industrial and agricultural uses, averaging less than 280 mg / L in total dissolved solids (TDS), (Stillwater Sciences 2014). This range is below both the California and U.S. EPA secondary drinking-water standard of 500 mg / L in TDS and the agricultural water quality limit of 450 mg / L in TDS.

Groundwater Quantity and Use

Historically, the average annual water demand in the Antelope subbasin has been approximately 31,300 acre-feet), however it may be 10 to 15 percent higher during abnormally hot and dry years (University of California Cooperative Extension 2013). The largest proportion of the annual water demand at 76 to 79 percent is irrigated agriculture followed by conveyance losses from agricultural canal systems which account for 13 to 16 percent of the annual demand (University of California Cooperative Extension 2013). Domestic, municipal and industrial water demands in the Antelope subbasin account for approximately seven percent of the annual water demand in the area (University of California Cooperative Extension 2013).

Water demand within the Antelope subbasin is met with both groundwater (approximately 46 to 55 percent) and surface water (45 to 54 percent), with groundwater extraction more prevalent in the northern and western portions of the subbasin, and surface water being relied upon more extensively in the eastern and southern portions of the sub-basin (University of California Cooperative Extension 2013).

Hydrologic Analysis

Currently, streamflow is not actively monitored in the Antelope Creek watershed, however USGS operated a streamflow gage (#11379000) from 1941 to 1982 which was located at the mouth of the Antelope Creek canyon which is approximately 1.2 miles upstream of the EDD. Due to the fact that this gage has been discontinued, discharge in Antelope Creek since 1982 has been estimated by prorating discharge measured at USGS gage in the adjacent Mill Creek watershed, located to the south of the Antelope Creek watershed. The Mill Creek gage (#11381500) has continuously operated since 1928, overlapping the entire period of record of the USGS gage on Antelope Creek. Antelope Creek discharge is estimated by using the ratio of average daily discharge at the two gaging stations during the common period of record (Stillwater Sciences 2014). The two gages are located in similar basin positions within each of the watersheds, which are similar in geology and geomorphology, however the Mill Creek watershed is larger in size with higher elevations and higher spring and summer streamflow, and has flows which are more heavily influenced by snow accumulation and snowmelt (Stillwater Sciences 2014).

Based on the data from the USGS gage (#11379000) previously in operation in Antelope Creek, the mean annual flow in Antelope Creek between 1941–1982 was 151 cfs, resulting in an average annual yield of approximately 109,000 acre-feet (Figure 17) (Stillwater Sciences and Resource Conservation District of Tehama County 2015).

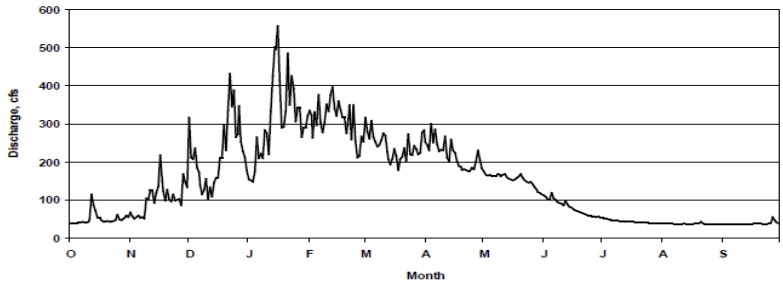


Figure 17. Antelope Creek Hydrograph

Average Annual Hydrograph in Antelope Creek at USGS Gage # 11379000 from 1941–1982. (Source: Stillwater Sciences and Resource Conservation District of Tehama County 2015)

Antelope Creek receives its stream flow from spring / summer snowmelt and winter storm rainfall and runoff. The annual hydrograph, on average, includes high flows events from November to April which are influenced by precipitation, a snowmelt runoff period from April into early June, and summer low flow from July through early October (Figure 18).

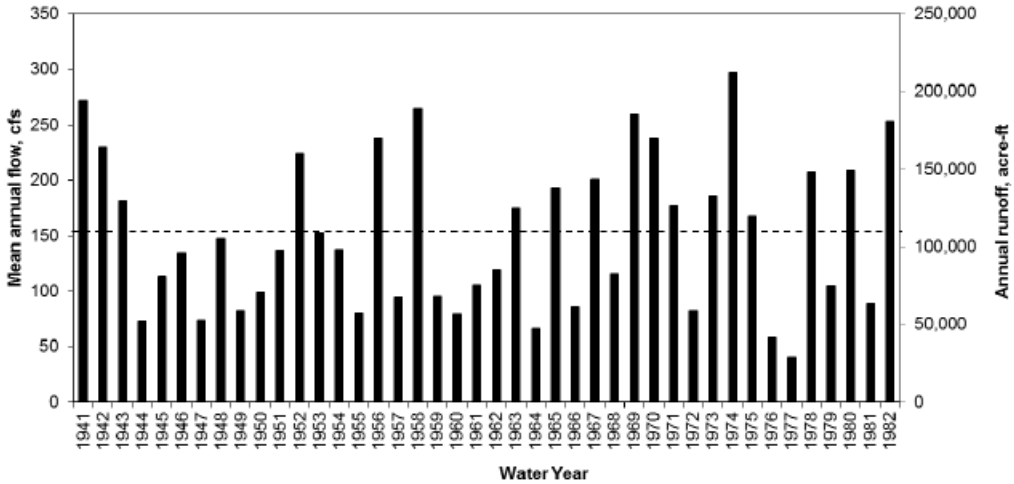


Figure 18. Annual Mean Flow and Runoff in Antelope Creek

Annual mean flow and mean annual runoff in Antelope Creek at USGS Gage # 11379000 from 1941–1982. The dotted line indicates the mean over the period of record (151 cfs, 109,000 ac-ft). (Source: Stillwater Sciences and Resource Conservation District 2015)

Typical summer baseflows at the Antelope Creek gage ranged from approximately 25 cfs to 40 cfs from July through September from 1941-1982 (Stillwater Sciences and Resource Conservation District of Tehama County 2015). The total diversion water right at the EDD between the two diverters is 130 cfs as described below in the Water Rights section. Water diversions usually begin in late-spring and take place through early-fall (approximately April through October). In some years, diversions may exceed Antelope Creek's natural flows, (Figure 19) especially during the summer and early fall.

In drier years, the maximum allowable diversion rates at the EDD have the ability to create migration barriers and / or dewater downstream reaches of the mainstem of Antelope Creek and Craig Creek during spring- and

fall-run salmon and steelhead migration periods, especially in dry and critically dry years (Figure 20) (Stillwater Sciences and Resource Conservation District of Tehama County 2015).

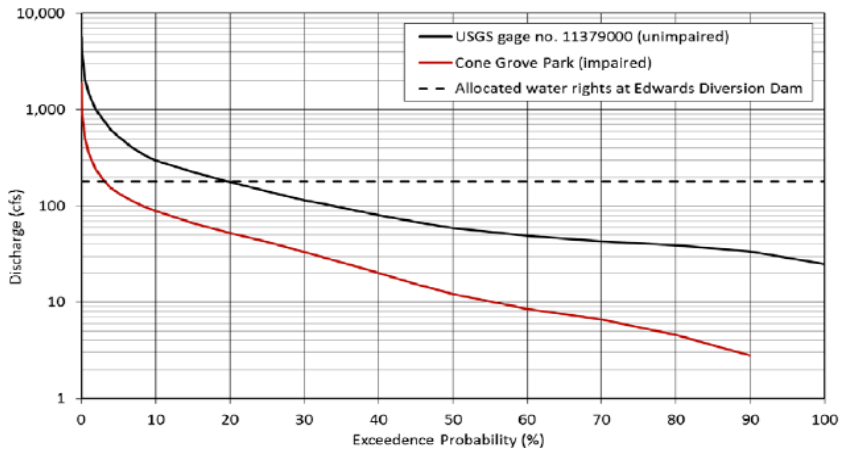


Figure 19. Exceedance Probability of Average Daily Discharge in Antelope Creek

Exceedance probability of average daily discharge in Antelope Creek measured at USGS Gage #11379000 and estimated at Cone Grove Park from 1941 to 1982. (Source: Stillwater Sciences and Resource Conservation District of Tehama County 2015)

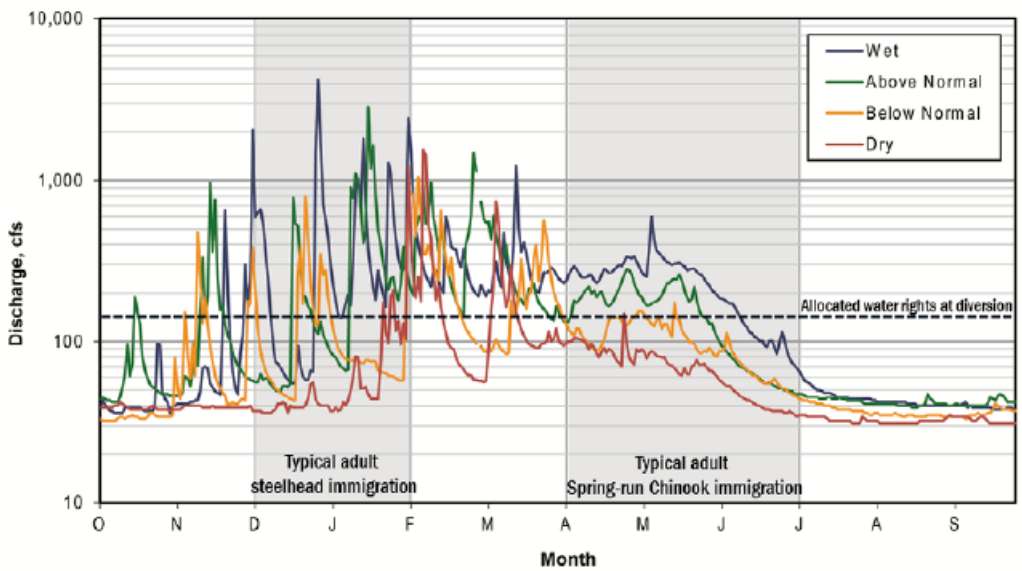


Figure 20. Annual Antelope Creek Hydrographs for Typical Water Years

Annual hydrographs at USGS Gage # 11379000 for typical wet (1952), above normal (1973), below normal (1945) and dry (1960) Water Years. (Source: Stillwater Sciences and Resource Conservation District of Tehama County 2015).

However, in recent years voluntary irrigation water curtailments between CDFW, NMFS, SWRCB and LMMWC and other curtailments involving the Edwards Ranch, are providing minimum flows for adult steelhead below EDD (Killam at al. 2016). Under current operations, LMMWC and Edwards Ranch may divert all of the streamflow during the late summer, however in previous years, instream flow agreements have been in place through a number of memorandums of understanding between both LMMWC and Edwards Ranch and CDFW and NMFS, as described in more detail in the Water Rights section below.

Water Rights

Two claims to riparian and three claims to pre-1914 appropriative water rights are recognized by the Water Board at the EDD. Edwards Ranch claims two riparian and pre-1914 rights (Statements 16326 [Edwards ditch] and 3134 [LMMWC ditch], respectively. LMMWC claims one pre-1914 right (Statement 2809). At diversion rates in excess of 75 cfs, flows are split equally between the two diverters (Stillwater Sciences and Resource Conservation District of Tehama County 2015). At diversion rates below 75 cfs, Edwards Ranch takes a greater proportion of the water available as the diversion rate declines. Flows are typically diverted between April 1 and October 31, and are measured by Parshall flumes installed in each ditch. Diverted flows are primarily used for agricultural purposes. In prior years, the LMMWC and Edwards Ranch diversions have accounted for approximately 95% of the total riparian and pre-1914 water use within the Antelope Creek watershed (Stillwater Sciences and Resource Conservation District of Tehama County 2015).

When both diversions operate, Antelope Creek is usually dewatered (Armentrout et al. 1998). Adult fall-run and spring-run Chinook salmon are generally unable to enter Antelope Creek during the diversion season (Reynolds et al. 1993). Accordingly, there are cooperative agreements between resource agencies and the water diverters to provide adequate flows (when possible) for salmon during the peak migration / spawning periods.

3.10.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

Impacts on water quality and hydrology were evaluated by analyzing regional and site-specific reports. The analysis was conducted through document review and site visits.

Significant impacts would occur to the water quality and hydrology if the project would:

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

No Action Alternative

Under this alternative, no changes would occur to the existing EDD diversion infrastructure. The two diversions would not be combined at the LMMWC Ditch headgate and the siphon under New Creek would not be constructed.

Proposed Action Alternative

Under this alternative, minor, short-term impacts are expected to occur to water quality and hydrology during construction. Water quality impacts such as short-term minor increases in turbidity and suspended sediment concentrations would likely occur due to project activities following instream construction during the rewatering process and potentially during the initial winter following construction due to erosion from the project construction areas. This is considered a potentially significant impact.

Water quality impacts such as causing a significant increase in alkalinity of the water could occur if wet concrete were to enter Antelope Creek or New Creek. This is considered a potentially significant impact. Water quality impacts to Antelope Creek and / or New Creek could occur if fuel, oil, other petroleum products or wet concrete were accidentally spilled as a result of construction activities and entered surface waters. This is considered a potentially significant impact.

There would be no expected impacts to water quality due to the redistribution of mercury from suspended sediments. The redistribution of sediments would likely cause a minor temporary increase in turbidity in Antelope Creek and New Creek. However, the Antelope Creek watershed does not have a significant mining history or known mercury issues and BMPs would be used to minimize turbidity.

There would be no expected impacts to the potential flooding of adjacent properties, nor the performance of the project or the local infrastructure. A USACE Hydraulic Information Center's River Analysis System model of Antelope Creek was developed that compared the existing and proposed conditions water levels for a range of flows to assess the relative impacts on water levels that the proposed project features may cause (Cascade Stream Solutions 2019). The proposed features are largely located within the footprint of the existing infrastructure and are in areas where there are not effective hydraulic conveyance areas. The model results confirm this and demonstrate that the project has no significant impact on water levels.

This alternative would not violate any water quality standards or waste discharge requirements, decrease or interfere groundwater supplies / recharge. It would not significantly alter existing drainage patterns or add impervious surfaces that would increase onsite or offsite flooding, contribute additional runoff water or impede or redirect flood flows. It would not risk pollutant release by seiche, tsunami, flood or mudflow inundation. The project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

The following measures would be implemented to avoid and minimize impacts to water resources and water quality and to mitigate potentially significant impacts to water resources and water quality to less than significant levels:

WATER-1: All instream construction shall be conducted in the summer / early fall during the low flow period (see measure FISH-2). Any work within the channel and banks, outside of this instream work window must be isolated from flowing water and dewatering will be required.

WATER-2: Monitoring of water turbidity and settleable materials shall be conducted in accordance with the Clean Water Act Section 401 Certification through consultation with RWQCB.

WATER-3: All equipment and machinery that contains fuel, oil or other petroleum products used during construction related activities shall be checked for petroleum leaks immediately prior to being mobilized to the project site and again each day prior to use.

WATER-4: All equipment refueling and / or maintenance shall take place within a secondary containment structure and a minimum of 100 feet away from Antelope Creek, New Creek, any wetlands or other aquatic sites.

WATER-5: An emergency spill kit and absorbent oil booms will be onsite during construction activities.

WATER-6: A dewatering permit will be obtained from the RWQCB, if deemed necessary based on the dewatering methods used.

WATER-7: All equipment operations within the channel and banks of Antelope Creek and New Creek will be required to use readily biodegradable hydraulic oil.

3.11 Land Use / Planning

3.11.1 Affected Environment

The Tehama County General Plan designations for the project site are Valley Floor Agriculture and Upland Agriculture. The Tehama County zoning designations within the project site are zoned Agricultural / Upland District (AG-1) and Agricultural / Valley District (AG-2). The project site is within the North Interstate Highway 5 (I-5) Corridor Planning Unit in the Tehama County General Plan (Pacific Municipal Consultants 2009). This planning area is located in the northern portion of Tehama County and includes the City of Red Bluff, the communities of the Lake California and Bend and the unincorporated areas of Bowman and Dibble Creek. This area is planned to accommodate a large portion of the growth in the County within the next 20 years through proposed large master-planned communities and developments and this area. The area currently supports large master-planned communities and developments and is also utilized for grazing and undeveloped open lands.

North to south road access within the North I-5 Corridor Planning Unit is provided primarily by Hooker Creek Road, Jelly's Ferry Road and I-5, and east to west by Bowman Road, Lake California Drive and SR 36 West.

3.11.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

The methodology used for the land use impact analysis involved an assessment of the compatibility of the proposed project with relevant plans and policies, and a review of the Tehama County General Plan, and zoning in relation to surrounding land uses and site features. The analysis was conducted through document review and site visits.

Impacts to land uses would be significant if they would:

a) Physically divide an established community;
b) Cause a significant environmental impact due to a conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

No Action Alternative

Under this alternative, no change of land use or activities would occur. Diverted flows from Antelope Creek would continue to service the private agricultural uses of the site and customer base of LMMWC and continue to provide a water supply for irrigation and livestock water. There would be no impacts to the current land use.

Proposed Action Alternative

Under this alternative, no change in land use would occur. The project area is located within Tehama County's AG-1 and AG-2 land use zones, which limits land uses to further agriculture production and related activities. The proposed project fits within acceptable improvements in the land use zones. The proposed project remains consistent with the goals, policies and objectives of the Tehama County General Plan and Zoning Ordinance and there would be no physical division of an established community. Project implementation would not interfere with, preclude, or conflict with existing land uses adjacent to the project area. The project would not conflict with any applicable land use plan, policy, or regulation of an agency with

jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect. Because there would be no impact to land use, no mitigation is required.

3.12 Noise

3.12.1 Affected Environment

Noise concerns are described in terms of sensitive receptors, or noise-sensitive land uses within hearing range of the activity. Aerial photography helped identify two potential sensitive receptors near the project site. These potential receptors were located within the Antelope Creek corridor to the north of Antelope Creek. The closest potential sensitive noise receptors to the project site are two residential houses located at approximately 0.73 and 0.76 miles from the construction zone of the project, and 90 and 100 feet respectively from the access haul route. These residences are associated with the Edwards Ranch, a member of the TAC and a project proponent. There are no public airports or private airstrips near the project site. The closest airport is located approximately seven miles to the southwest.

The area surrounding the project site ranges from rural residential and ranch land to remote rangeland. There is paved and gravel public road access to the entrance of the Edwards Ranch, with private gravel and unsurfaced road access from the ranch entrance to the project site. There is limited daily traffic noise in the area of the project site due to the rural residential and agricultural uses in the area and from routine vehicle access for livestock operations, stream flow gage maintenance, fish screen maintenance, dam and fish ladder maintenance, water diversion and canal maintenance and fisheries surveys. There is existing ambient and background noise associated with Antelope Creek, the ditch headgates, the fish screens, dam spillways, fish ladder and varied wildlife activities. Varying ambient noise level at the headgates to the ditches, fish ladder and dam is dependent upon the volume of water flowing over the structures.

3.12.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

Construction noise related to the project site improvements are the focus of this analysis. Assumptions related to construction equipment and industry noise averages were used to evaluate construction-related noise impacts.

An impact related to noise would be significant if the project would cause:

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
b) Generation of excessive ground borne vibration or ground borne noise levels;
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.

No Action Alternative

Under this alternative, the proposed project would not be implemented, therefore no change in permanent, temporary or periodic ambient noise levels would occur.

Proposed Action Alternative

Under this alternative, construction vehicles entering and leaving the project site would temporarily increase traffic levels and, thus, ambient noise levels along a total of 1.60 miles of paved public roads, 0.73 miles of unpaved public road and 1.38 miles of unpaved private road from SR 99 East. During the construction phase of the project, noise from construction activities would also temporarily impact the environment in the

immediate area. The noise levels of typical construction equipment which could be used to implement the project are shown in Table 9.

Table 9. Typical Construction Equipment Noise			
Equipment Description	**At 50 feet (Decibels, Acoustic, slow)**	**Equipment Description**	**At 50 feet (Decibels, Acoustic, slow)**
Auger Drill Rig	85	Concrete Pump Truck	82
Backhoe	80	Crane	85
Boring Jack Power Unit	80	Dozer	85
Compressor (air)	80	Dump Truck	84
Concrete Mixer Truck	85	Excavator	85
Flatbed Truck	84	Jackhammer	85
Front-End Loader	80	Pneumatic Tools	85
Generator	82	Pumps	77
Grader	85	Rock Drill	85

(Source: Reherman et al. 2006)

There would be no permanent noise impacts resulting from implementation of the proposed project. However, adjacent landowners within the general vicinity of project construction at the site could encounter increased noise levels during construction activities; in excess of the Tehama County General Plan standards of 50 Energy-Equivalent Level (LEQ), depending on site-specific topography and vegetative screening. LEQ measures individual noises for a period of time (typically for one hour) and determines the average noise level. Mobile equipment such as excavator, loaders, etc., may operate in a cyclic fashion in which a period of full power is followed by a period of reduced power and noise. These activities could temporarily and periodically increase ambient noise levels within the project area but there are no sensitive receptors, or noise-sensitive land uses within hearing range of the activity. Any impacts would be temporary and localized and considered less than significant.

Recreational users in the general vicinity of the site could encounter increased noise levels during construction activities if they were near the project site during daytime hours on weekdays, however the impact would be temporary and localized. Recreational uses in the project area are very limited due to the fact that the project site and surrounding parcels are all located on private property. Noise impacts to recreational uses are considered less than significant.

It is not anticipated that ground vibration created by project activities would be detectable at any sensitive receptor locations nor result in any structural damage. There are no noise-related impacts relating to public airports or privately owned airstrips adjacent to, or within two miles of the project area. Because noise related impacts are less than significant, no mitigation is required.

3.13 Population / Housing

3.13.1 Affected Environment

The project site is located on several rural private parcels of varying acreage. In the vicinity of the project site, there are two residences and numerous outbuildings within the affected environment.

3.13.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

Analysis of the potential population and socioeconomic impacts of the proposed project included qualitative assessments of potential impacts associated with housing, conflicts with county and local plans, population growth, displacement of persons and businesses, and community disruption.

a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure); or
b) Displace substantial numbers of existing people of housing, necessitating the construction of replacement housing elsewhere.

No Action Alternative

Under this alternative, there would be no impacts to the demographic or socioeconomic characteristics of the project, or surrounding area. The current land use and zoning, combined with the rural transportation infrastructure of the project area, limits substantial population growth and displacement.

Proposed Action Alternative

Under this alternative, project construction would not cause an economic or housing disruption through substantial unplanned population growth in an area, either directly or indirectly. The project improves fish passage conditions at the project site, however it does not extend the infrastructure or increase production capacity. The project structures currently serve only those with water rights from Antelope Creek and other LMMWC customers. Modifications associated with the project would continue to provide irrigation water to sustain the current agricultural and residential needs. No short-term or long-term residential housing displacement or displacement of people would occur as a result of the proposed project. No new transportation infrastructure or businesses would develop as a result of the project which would directly or indirectly influence local or regional population growth. Since there are no impacts to nearby populations or housing, no mitigation is required.

3.14 Public Services / Utilities

3.14.1 Affected Environment

The utility needs for the project site are self-contained and not dependent upon public infrastructure. Existing entitlements from the project area help to service the agricultural and residential irrigation water needs of the Edwards Ranch and the LMMWC.

3.14.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

The analysis of the potential effect on public services and utilities / energy resources as a result of the proposed project consists of identifying public services and utilities / energy resources near the project area and determining whether implementation of the action would impact these resources. In addition to evaluating the impacts on these resources, an evaluation was made of the project's consistency with Tehama County General Plan objectives.

An impact related to public services and utilities would be significant if the project would:

a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the

construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

   i. Fire protection
   i. Police protection
   ii. Schools
   iii. Parks
   iv. Other public facilities

b) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects;
c) Not have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years;
d) Not result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
e) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals ; or
f) Not comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

No Action Alternative

Under this alternative, no demand for public services would occur over the short-term or long-term. There are no utility needs within the project area.

Proposed Action Alternative

Under this alternative, since the project would not require new, the relocation of, or the expansion of governmental or telecommunications facilities, there would be no environmental impacts on service ratios, response times or other public services performance objectives. The project would not increase or impact wastewater treatment demands. Site irrigation diversion would continue under existing water rights.

Construction would result in the generation of solid waste associated with the project as well as other construction-related waste (e.g., garbage, containers, and oil). The project would dispose all generated solid waste in a landfill with sufficient permitted capacity, and would comply with federal, state, and local solid waste statutes and regulations. Disposal of potentially hazardous waste is further evaluated in Section 3.8, Hazards and Hazardous Materials. No impacts would result to public utilities and services in the project area as a result of the proposed project and as such no mitigation is required.

3.15 Recreation

3.15.1 Affected Environment

The parcels upon which the project site is located, along with the surrounding parcels are all privately owned and located on the Edwards Ranch, a working cattle ranch, farm and orchard. The majority of land in the lower Antelope Creek watershed is privately owned. The closest public land located near the project site is Cone Grove Park, located approximately one mile to the south and the Tehama Wildlife Area, located approximately 6.5 miles from the project site at its closest border. Cone Grove Park is operated by Tehama County and the Tehama Wildlife Area is managed by CDFW. Fishing opportunities occur along Antelope Creek, however access is limited due to the fact that the majority of the property in the lower Antelope Creek watershed is held in private ownership. Non-public hunting opportunities are also available within the

general area of the project. There are no developed regional or neighborhood parks or other recreational facilities within, or directly adjacent to the project site.

3.15.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

The analysis of potential effect on recreational resources as a result of the proposed project consists of identifying recreational resources near the project area and determining whether implementation of the action would impact these resources. In addition to evaluating the impacts on recreational resources, an evaluation was made of the project's consistency with Tehama County recreation objectives.

Impacts associated with recreational uses would be significant if the project would:

a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or
b) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

No Action Alternative

Under this alternative, no change in recreational uses would occur. The type of recreational activities within the project area, as well as upstream and downstream of the project site would remain unaffected. Potential recreational benefits, in the form of increased fish populations as a result of the proposed project, would not occur.

Proposed Action Alternative

Under this alternative, no new recreational facilities would be required nor would any existing facilities be negatively impacted or required to be expanded. Project construction activities would be coordinated with the project site landowner. During project construction activities, a limited duration of increased noise in the general area of the project site would occur which could potentially impact recreational uses for a short time, in particular fishing and / or hunting activities. However, because recreational use of the area appears to be light, and recreational uses are also available farther away from the project sites, coupled with the fact that the impact would be short in duration, this is considered a less than significant impact.

Mitigation measures for potential water quality impacts will be implemented to make sure that any materials released into the river, which could cause a nuisance or adversely affect downstream recreation uses, would not result in a significant impact. Refer to Section 3.9 Hydrology and Water Quality for water quality mitigation measures. The project would not increase or require the construction / expansion of recreational parks or facilities and there would be no adverse physical environment effects or deterioration of recreational facilities. As such, no mitigation is required.

Beneficial impacts to recreation may result from increased fish populations, both locally and regionally.

3.16 Soils / Geology / Minerals

3.16.1 Affected Environment

Soils

Six different soil map units occur within the project site (Figure 21) according to the local soil survey (Soil Conservation Service et al. 1967). The six identified map units are listed below:

Molinos fine sandy loam, moderately deep over clay (Mz)

These soils are deposited over soils similar to Berrendos clay and are from recent alluvium derived from basic igneous rocks, mainly andesite and basalt. They are well-drained to somewhat excessively drained, permeability is moderately rapid and runoff is very slow. The taxonomy of the soil is fine-silty, mixed, nonacid, thermic, Typic Xerorthents (Natural Resources Conservation Service 2018).

Molinos complex, channeled (Mzt)

These soils are located along active streams east of the Sacramento River between 200 and 1,000 feet in elevation. The soils are from recent alluvium which is derived from basic igneous rocks, mainly andesite and basalt. This nearly level complex consists of well-drained to somewhat excessively drained soils. This complex can consist of any of the Molinos soils. The taxonomy of the soil is coarse-loamy, mixed, nonacid, thermic, Aquic Xerofluvents (Natural Resources Conservation Service 2018).

Riverwash (Rr)

This soil map unit consists of channels of intermittent streams and of active streams where the water is high and is made up of deposits of sand and gravel. The soil is not classified by higher categories in the soil survey.

Tuscan cobbly loam, 1 to 5 percent slopes (Tub)

This series is located on the tops of old gently sloping terraces east of the Sacramento River. The soils are formed from old alluvium washed from areas of volcanic rock. The subsoil is underlain by a hardpan located at ten to 20 inches in depth. The taxonomy of the soil is fine, montmorillonitic, thermic, Typic Durixeralfs (Natural Resources Conservation Service 2018).

Tuscan cobbly loam, moderately deep, 1 to 5 percent slopes (TvB)

These soils are located on level to gently sloping soils formed in old alluvium washed from areas of volcanic rock. They are comprised of rounded cobblestone three to ten inches in diameter on one to ten percent of the surface and are well-drained. The taxonomy of the soil is fine, montmorillonitic, thermic, Typic Durixeralfs (Natural Resources Conservation Service 2018).

Vina loam, 0 to 3 percent slopes (VnA)

This soil is found east of the Sacramento River from 200 to 1,000 feet in elevation and was formed from recent alluvium washed from areas of volcanic rock. This soil is well drained and permeability is moderate. Runoff is very slow. The taxonomy of the soil is coarse-loamy, mixed, superactive, thermic, Pachic Haploxerolls (Natural Resources Conservation Service 2018).

Geology

The following is an excerpt from *Fish Passage in Lower Antelope Creek* (Stillwater Sciences and Resource Conservation District of Tehama County 2015).

> Antelope Creek watershed is divided into two distinct geologic terranes: the mountainous southwestern Cascade Range comprised of Tertiary volcanic rocks and the northeastern Sacramento Valley comprised of Quaternary sediments. The two terranes are separated by the Chico Monocline, a prominent northwest-trending tectonic flexure of Late Cenozoic age which bounds the eastern margin of the Sacramento valley from Red Bluff to Chico (Harwood and Helley 1987). The Chico Monocline creates an abrupt topographic change from the steep, bedrock confined channel reaches draining the Cascade Range to the lower gradient, and less unconfined channel reaches traversing the Sacramento Valley. This abrupt topographic break forces development of large coalescing alluvial fans along the mountain front where these river systems deposit their coarse load. Distributary channel networks are developed across these fan surfaces in Antelope, Little Antelope, Mill and Deer creeks.

The dominant geologic unit in the upper watershed is the Tuscan Formation comprised of interbedded lahars (volcanic mudflow), fluvial deposits, ash-flow and air-fall tuffs, and basalt flows of late Pliocene age (~3.3 Ma) (Lydon 1968, Helley and Harwood 1985).

The Tuscan Formation extends beneath Quaternary sediments in the northeastern Sacramento Valley. The Antelope Creek, Craig Creek and Butler Slough channels are relatively fixed by resistant outcrops of this geologic unit upstream of approximately SR 99 East.

The oldest Quaternary geologic unit in the Sacramento Valley is the Red Bluff Formation, a thin (three- to 33-foot-thick), coarse-grained and highly weathered fanglomerate derived from erosion of the Tuscan Formation and associated volcanic rocks (Diller 1894, Helley and Harwood 1985). The Red Bluff Formation occurs in lower Antelope Creek as a broadly dissected surface along the mountain front from north of Mill Race Creek to south of Little Antelope Creek (Blake et al. 1995). Antelope Creek impinges on the Red Bluff Formation at the head of the alluvial fan and intermittently in downstream reaches.

A series of fan and river terrace deposits are inset within and/or overly the Red Bluff Formation: the Lower Riverbank, Upper Riverbank, Lower Modesto and Upper Modesto formations (Helley and Harwood 1985). These formations step up in elevation and increase in age with distance from the present-day stream channels. They average about six-to-13-foot-thick and are composed of weathered alluvial sediment similar to modern stream channel deposits. Where present-day channels impinge on the Riverbank Formation, the consolidated deposits and well developed soils are moderately resistant to erosion. The less consolidated and less weathered deposits of the upper and lower Modesto formations are extensive along the Sacramento River and its tributaries and are typically more erosive. Much of the lower Antelope Creek channel network is bordered by deposits of Modesto age.

3.16.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

The soils, geology and mineral resources analysis is based on information in the *Soil Survey of Tehama County, California* (Soil Conservation Service et al. 1967), and a review of reports regarding regional geology, soils, and mineral resources, as well as the Alquist-Priolo Earthquake Fault Zoning Map (California Department of Conservation 2019b).

Significant impacts would occur if the project would:

a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

    i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.
    ii. Strong seismic ground shaking.
    iii. Seismic-related ground failure, including liquefaction.
    iv. Landslides.

b) Result in substantial soil erosion or the loss of topsoil;
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse;
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property;
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water

disposal systems where sewers are not available for the disposal of waste water;

f) Directly or indirectly destroy a unique paleontological resource site or unique geologic feature?
g) 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; or
h) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

No Action Alternative

Under this alternative, there would be no impact to soils, geology or minerals due to the fact that the project would not be implemented.

Proposed Action Alternative

Under this alternative, the project would not directly or indirectly cause potential substantial adverse effects such as ruptures of known earthquake faults, strong seismic ground shaking, ground failures or landslides. The Alquist-Priolo Earthquake Fault Zoning Act (1972) and the Seismic Hazards Mapping Act (1990) direct the State Geologist to delineate regulatory "Zones of Required Investigation" to reduce the threat to public health and safety posed by earthquake-triggered ground failures. Cities and counties affected by the zones must regulate certain projects within them. The site is not located within an Alquist-Priolo Earthquake Fault Zone and no known active or potentially active faults are known to cross the site (Holdrege & Kull 2018). There is a very low probability for liquefaction to occur at the site during an earthquake on a nearby fault (Holdrege & Kull 2018).

The project would not be located on expansive soil or a geological area that is unstable, or that would become unstable which could result in landslides, lateral spreading, subsidence, liquefaction, collapse or create substantial risks to life or property. No waste water disposal would occur requiring soil capable water disposal systems. The project would not result in the loss of a local mineral recovery site or a regional or state valued mineral resource.

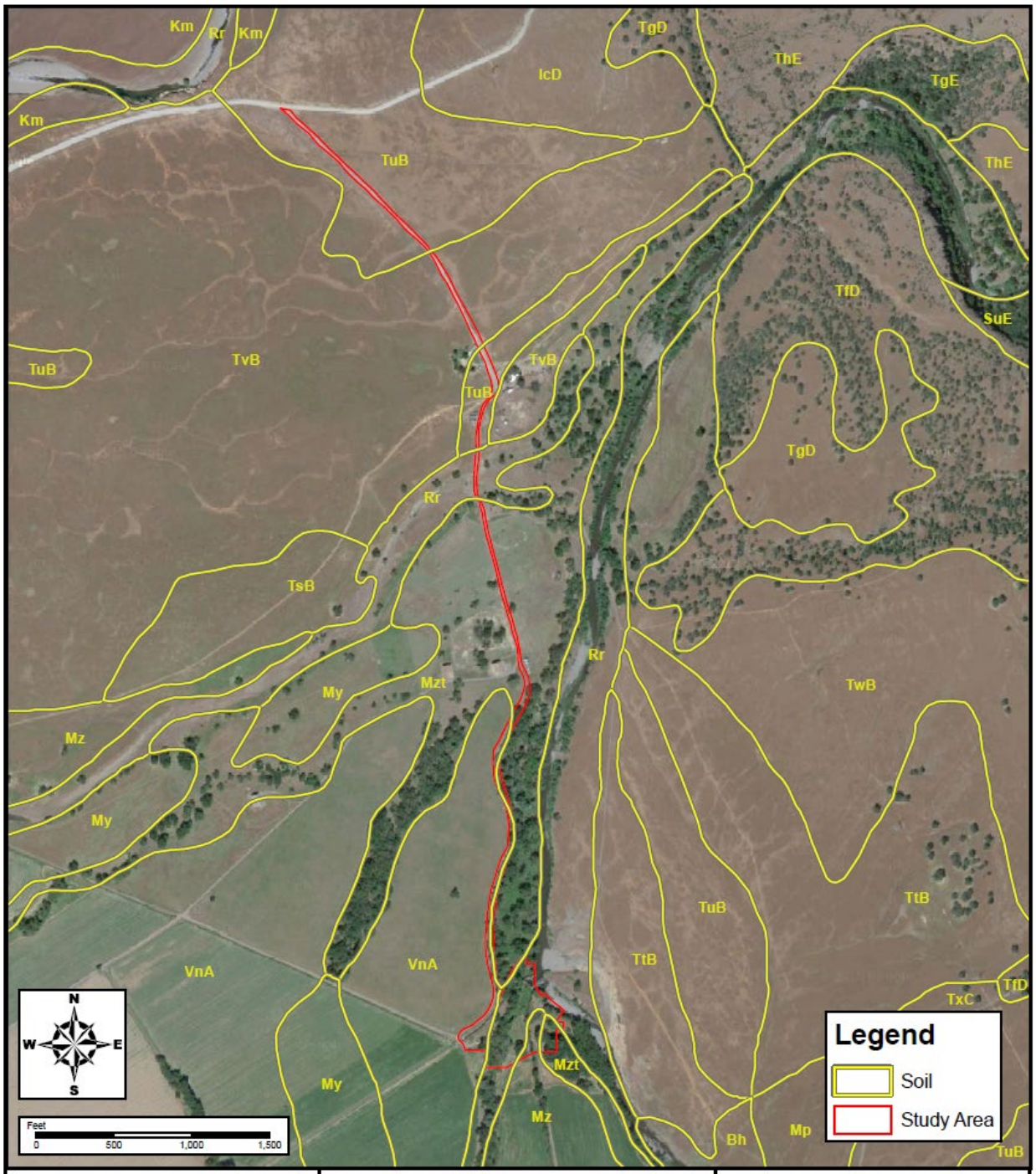
Construction-related ground disturbances would occur as a result of the construction of the new inverted siphon, fish screen and bypass return pipe, and other work associated with water conveyance retrofitting and upgrades. Substantial soil erosion could occur as a result of the ground disturbance which is considered a potentially significant impact. The project would not directly or indirectly destroy a unique paleontological resource site or unique geologic feature. Paleontological resources are addressed in section 3.5 Cultural and Tribal Cultural Resources.

The following measures would be implemented to avoid and minimize impacts to soils, geology and mineral resources and to mitigate potentially significant impacts listed above to less than significant levels:

SOIL / GEO / MIN-1: After ground-disturbing activities are complete, all disturbed areas (outside of the active stream channels and the ditch bottoms) shall be seeded with native plant species and mulched as approved by the landowner and described in the revegetation plan and the Storm Water Pollutions Prevention Plan (SWPPP), if required.

SOIL / GEO / MIN-2: Construction of all project actions shall comply with the RWQCB Basin Plan Objectives and an erosion control plan. Standard Best Management Practices (BMPs) will be incorporated into the project designs and / or the SWPPP, if required.

SOIL / GEO / MIN-3: If the total disturbance area is greater than one acre, a Notice of Intent will be submitted to the State Water Resources Control Board to obtain coverage under the National Pollution Discharge Elimination System General Permit for Discharges of Storm Water Associated with Construction Activity.



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Antelope Creek Fish Passage Improvement Project

Tehama County, California

September 2019

Figure 21. Soil Survey Map

PHOTO SOURCE: Google Earth, 4/15/2015

3.17 Transportation

3.17.1 Affected Environment

SR 99 East is the main highway near the project site. From SR 99 East, the project site would be accessed from Hogsback Lane, a public road which is partially paved and partially gravel-surfaced, and an approximate 1.38 mile section of unpaved private road to access the main construction area of the project site. Aside from a portion of the private ranch road, all routes are two-lane surfaced roads which access private parcels. The project area is relatively rural and most of the roads are commonly used for large farm equipment and heavy-duty vehicles and off-road vehicles for agricultural operations.

3.17.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

A qualitative assessment of traffic effects was performed, based on the construction procedures and equipment that would be used and a site review of existing conditions.

An impact related to transportation would be significant if the project would:

a) Conflict with a program, plan, ordinance or policy addressing the circulation system including transit, roadway, bicycle and pedestrian facilities;
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b);
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or
d) Result in inadequate emergency access.

No Action Alternative

Under this alternative, the project would not occur, therefore no transportation or traffic effects would occur.

Proposed Action Alternative

Project construction activities would require truck and worker trips on SR 99, on Hogsback Lane and on the privately owned graveled and dirt haul roads to access the project site. The proposed project would increase vehicle trips and type of equipment transported on these routes. At the project site, construction vehicles would temporarily increase traffic levels on a total of 1.60 miles of paved public roads, 0.73 miles of unpaved public road and 1.38 miles of unpaved private road from SR 99 East. Construction equipment i.e. large trucks and excavators, would be mobilized to the site prior to project activities and would be moved upon completion of these activities.

Vehicle and heavy machinery access to the project area would occur on the existing roads and to the extent possible, on the existing parking areas of the private unpaved project access road. Portions of the private unpaved road would be employed for equipment staging. No new road construction (or maintenance to existing roads) is planned in conjunction with the project.

Project traffic would arrive on Hogsback Lane, after traveling through the more highly used and urbanized SR 99 East highway which provides regional access through the area. Delivery of heavy equipment and construction employee traffic would occur during up to three months of project activities. Trucks for transportation of water for dust control, construction workers and construction materials would also access the site daily.

During the construction period when the greatest number of workers and trucks would be required, approximate trips to the site and equipment needed at the project site is as follows:

Trips:

- 40 trips for concrete trucks (standard 9-yard concrete trucks)
- 15 trips for hauling rock onsite and offsite (10-wheel dump truck, pulling a 20-cubic-yard trailer)
- 4 trips for hauling debris or salvaged materials off site (10-wheel dump truck)
- 4 trips to haul pipe to site (tractor trailer w/ 40ft flatbed)
- 2 trips for delivery of metal work fabricated offsite (20ft flatbed)
- 6 trips for mobilization/demobilization of equipment (tractor trailer w/ 40ft flatbed)
- 170 construction worker trips with gasoline or diesel powered medium duty passenger trucks
- 130 project management / engineering staff trips with gasoline or diesel powered medium duty passenger trucks

Equipment:

- 1 medium excavator
- 1 small excavator
- 1 large front-end loader
- 1 skid-steer loader
- 1 offroad dump truck
- 1 skiploader/backhoe
- 1 boom truck
- 1 concrete pump truck
- 1 small trencher
- 1 HDPE pipeline fusion equipment
- Compactors
- Miscellaneous hand and power tools

Throughout construction, the amount of daily construction equipment traffic would be limited by staging the construction vehicles and equipment within the project boundary for the duration of work. Daily trips to the project site would occur from construction workers and water trucks throughout the construction period. Post-construction activities i.e. revegetation, maintenance and monitoring would require intermittent access for approximately two to three years.

The potential increase in traffic generated from construction along SR 99 East would be localized and minimal. Project related traffic would not increase traffic on the local roads to a level that is substantial in relation to the existing traffic load, or capacity of the road system. Because of the relatively minor number of construction-related trips added to federal, state and local roads, and the temporary nature of construction traffic, the project is not expected to result in significant increases in traffic volumes. SR 99 East is a designated truck route that was built to withstand occasional use by heavy equipment and was designed to accommodate a mix of vehicle types, including heavy trucks. The project is not expected to add significantly to roadway wear-and-tear. Construction traffic would increase on the other local paved roads in conjunction with the various construction activities. The local roads over which project related trucks and heavy equipment must pass may have been constructed and / or maintained to support substantial volumes of truck traffic. The local roadways have previously provided, and currently provide access for construction-related and maintenance activities on a regular continuous basis. Use of these roads by project related trucks and heavy equipment would likely not increase the wear-and-tear on the local roadways to a level which would result in adverse impacts on the road conditions due to roadway design and existing condition. Standard construction and transportation practices would also be implemented to reduce the potential adverse impacts on roadway conditions. Additionally, these roads have been used previously for similar projects involving construction at this site, including agricultural activities and retrofit activities for the fish

ladder at EDD including the use of similar materials, heavy equipment and other equipment at the project site. Project-related impacts to traffic patterns, levels of service, loads and capacity of the road systems are considered less than significant.

Project construction activities would be managed to ensure that the rural roads serving as access to the project site would remain open to through traffic. Temporary traffic control may be necessary during mobilization and demobilization of heavy equipment; however no road closures are planned. Construction activities would not reduce / close existing traffic lanes, therefore, congestion caused by construction vehicles accessing the work areas from local roads would be minimal and limited to the short-term duration of the project work. The project would largely involve weekday activity when the roads in the general area would be lightly used. Project activities would not normally occur on weekends. Project-related impacts to congestion would be less than significant.

The project would generate a total of 371 vehicle and truck trips over a three-month period. Six truck trips would occur for mobilization / demobilization of equipment. Therefore, a total average of 6 trips would occur per day. Tehama County has not yet developed thresholds for the newly adopted CEQA guidelines, however, the Governor's Office of Planning and Research recommends in their Technical Advisory to look at vehicle miles traveled (VMT) when considering energy use from construction and operations (Governor's Office of Planning and Research, State of California 2018). For small projects that result in fewer than 110 trips per day, it is generally assumed that a less than significant transportation impact would occur. As such the project would not conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).

The project would not conflict with CEQA Guidelines or a program, plan, ordinance or policy addressing the circulation system, nor would it result in inadequate emergency access. No changes to geometric design features would occur that would increase circulation hazards. As a result of the proposed project, impacts on transportation and traffic would be less than significant.

3.18 Wildfires

3.18.1 Affected Environment

Areas of significant fire hazards are mapped by CAL FIRE based on factors such as fuels, weather and terrain (County Tehama et al. 2018). The project area where activities would occur is in State or Federal Responsibility Areas and Local Responsibility Areas on lands classified as Non-VHFHSZ (California Department of Forestry and Fire Protection 2008) but are approximately a half mile from lands classified as being in the Very High Fire Hazard Severity Zone (VHFHSZ). The project site is served by the Tehama County Fire Department /CAL FIRE Tehama-Glenn Unit.

Annual average wind speed is rated throughout the U.S. with Power Classes 1 through 7 (with Class 1 being the lowest). Winds throughout Tehama County where the project site is located are rated as Class 1 and Class 2 (County Tehama et al. 2018). Vegetation where the project activities will occur consists of Mixed Riparian Woodland / Scrub, Valley Oak Woodland, and Ruderal Annual Grassland/ Herbland. Lands surrounding the site consist of cultivated fields. Slopes at the site range from 0-5%. Land uses downstream include rural residential and ranch land to remote rangeland.

Wildfire hazards are addressed in the Tehama County Multi-Jurisdictional Hazard Mitigation 2018 Plan Update (Volume 1) (Tehama County et al. 2018) and the Revised 2015 Multi-Hazard Emergency Evacuation Plan (County Tehama et al. 2015). Some of the leading causes of wildfires in Tehama County include equipment use (15%) and electrical use (5%), smoking (1%), and vehicles (6%) (County Tehama et al. 2018).

3.18.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

The wildfire analysis is based on site visits, technical reports, maps, and photos, as well as other reports and studies generated specifically for wildfires at or near the project site.

An impact related to wildfire would be significant if the project would:

a) Substantially impair an adopted emergency response plan or emergency evacuation plan;
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;
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; or
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.

No Action Alternative

Under this alternative, no construction activities would occur and thus there would be no impact on wildland fire potential or catastrophic fire behavior because the project would not be implemented.

Proposed Action Alternative

Under this alternative, project construction activities would be managed to ensure that the rural roads serving as access to the project site would remain open to through traffic. Temporary traffic control may be necessary during mobilization and demobilization of heavy equipment; however no road closures are planned. Construction activities would not reduce / close existing traffic lanes, therefore, congestion caused by construction vehicles accessing the work areas from local roads would be minimal and limited to the short-term duration of the project work. The project is not proposing any new roads or road maintenance. Traffic would not be increased during long-term operation /maintenance activities. As proposed, the project would not interfere with emergency response vehicles in the area, including evacuations that may occur due to fire or other natural and manmade disasters.

Slopes and wind speeds at the site are minimal. After construction of the site, operations would basically remain the same. The project would not create landslide, runoff, drainage or post-fire instability risks. Impacts related to the physical environment at the site would be less than significant.

Existing roads and parking areas would be utilized for the project. Portions of the private unpaved road would be used for equipment staging. Due to increasing dry conditions during the summer months, hot exhaust pipes and mufflers can start fires when pulling off into vegetated areas (California Department of Forestry and Fire Protection). This impact could be significant, but would be mitigated with AIR-1 (see Section 3.3). Smoking at construction sites is not uncommon. Both workers and visitors might smoke near dry vegetation, however, mitigation which prohibits smoking at the site is provided with VEGETATION-7 (see Section 3.4).

Construction activities at the site could also be a potential source of wildfire ignition. The vegetation in the project area is composed of a fire-adapted vegetation community and is susceptible to wildfire. During construction activities, different tools will be used and likely will be powered by a generator.

The following measure would be implemented to avoid and minimize impacts related to wildfire hazards to less than significant levels:

WF-1: All designated parking areas shall be kept free of dry vegetation before and during construction. Before construction begins, signage shall be installed at the entrance to the project site that prohibits parking outside of designed parking areas. Where heavy equipment or generators are used, fire extinguishers shall be made available on, or nearby the equipment.

3.19 Cumulative Effects and Other CEQA and NEPA Considerations

This EA / IS includes a discussion of statutory considerations required under CEQA, such as cumulative impacts, the significant environmental effects of the proposed project, the significant effects which cannot be avoided if the proposed project is implemented, and growth-inducing effects of the project. Additional discussions are also required under NEPA, such as the significant irreversible and irretrievable commitments of resources and the relationship between local short-term uses of the environment and the maintenance of long-term productivity. These considerations are addressed below.

Cumulative Effects

This section provides a description of other actions in the area and a discussion of the cumulative impacts of those projects, in combination with the previously identified effects of the proposed project. A cumulative impact is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7). CEQA Guidelines Section 15355 states which "cumulative impacts refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.

a) The individual effects may be changes resulting from a single project or a number of separate projects.
b) The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future project s. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time."

Changes to the local environment will be made through project construction activities at the project site. The proposed project is intended to provide long-term improvements to the environment through improved fish passage. The proposed project would improve fish passage for native species and alleviate the current downstream fish passage restrictions. Improving habitat connectivity is an important factor which helps reduce the risk of extinction of species and populations during environmental changes such as climate change. Effects of the proposed project would be positive towards maintaining the quality of the human environment. Overall, the proposed project would cause short-term impacts to some environmental resources. Mitigation measures would result in these impacts being less than significant. Analysis for the individual resources considered in this EA / IS are described within the individual sections of this document.

There are several watershed restoration projects and RPMs which have been implemented in the Antelope Creek watershed by the LMMWC, Edwards Ranch, CDFW, U.S. Forest Service, NMFS and / or the USFWS over the past approximately 20 years. These projects include but are not limited to fish rescue and relocation activities, installation and operation of fish video monitoring systems, erosion and sediment reduction projects, fish passage improvements on EDD, fish screening in the ditches, fish passage improvements at low

water stream crossings, culvert replacements, riparian habitat / wetland restoration and road decommissioning.

The cumulative impacts of these projects and the Antelope Creek Fish Passage Improvement project are not anticipated to be negative, and in fact should improve natural resource conditions for anadromous fish and other native species in the Antelope Creek watershed. In addition, AFRP and state resource agencies have recently implemented, and are planning several other anadromous fish passage improvement projects on several Sacramento River tributary streams. The cumulative impacts of these projects and the Antelope Creek Fish Passage Improvement Project are not anticipated to be negative, and in fact should improve natural resource conditions for anadromous fish and other native species in the larger Sacramento River watershed.

Irreversible and Irretrievable Commitments of Resources

NEPA (Section 102) and the CEQ NEPA implementing regulations (40 CFR 1502.16), require a discussion of "any irreversible and irretrievable commitments of resources which would be involved in a proposed project should it be implemented." Section 15126.2(c) of the CEQA Guidelines also requires a discussion of the significant irreversible environmental changes which would result from implementation of a proposed project.

Implementation of the proposed project would not involve the substantial use of nonrenewable resources in such a way which would result in conditions which would be irreversible through removal or nonuse thereafter. Implementation of the proposed project would result in the use of fossil fuels, a nonrenewable form of energy for construction activities. A relatively minor amount of nonrenewable resources would be used in the project construction, transport of equipment and personnel, and related activities at the project area. The material requirements for this project would be relatively minor compared to the overall demand for such materials, and the use of these materials would not have a significant adverse effect on their continued availability. Future generations would not be committed to irreversible consequences or uses and the effect on future generations would be beneficial as a result of the restored stream ecosystem and related fishery resources. No irreversible damage from environmental accidents would be foreseeable in association with the proposed project.

Local Short-Term Uses and Long-Term Productivity Relationship

Section 102 of the CEQ NEPA Regulations and CFR 1501.16 require that an environmental document include a discussion of "the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity." The proposed project does not involve a trade-off between a "local short-term use" of the environment and the maintenance and enhancement of the environment in the sense contemplated by NEPA. Implementation of the proposed project is intentionally aimed at restoring and enhancing the long-term biological and environmental productivity of the fishery resource in Antelope Creek and downstream in the Sacramento River system. Construction impacts associated with the proposed project would be short-term and temporary. Short-term effects to the environment from construction include soil erosion, air quality emissions, noise, disturbance to fish, wildlife, vegetation and wetlands, and temporary surface water quality impacts. In the long-term, however, the proposed project would improve passage conditions for native fish species, including several state and federally listed species. Implementation of the proposed project would not sacrifice the long-term productivity of the project area for short-term uses during construction.

Growth-Inducing Impacts

Under CEQA, growth itself is not assumed to be particularly beneficial, detrimental, or insignificant to the environment. If an action is determined to be growth-inducing, an evaluation is made to determine whether significant impacts on the physical environment would result from which growth. Analysis of growth-inducing impacts includes those characteristics of an action which may encourage and facilitate activities which would

affect the environment, either individually or cumulatively. For example, an increase in population may impose new burdens on community service facilities. Similarly, access route improvements may encourage growth in previously undeveloped areas. Implementation of the proposed project would not contribute to significant development or economic growth in the vicinity. No businesses would be established or housing required as a result of this project. Therefore, no growth inducement would result from implementing the proposed project.

3.19.1 Environmental Commitments and Mitigation Measures

Because this document is a joint NEPA / CEQA document, mitigation measures have been identified for potentially significant impacts in compliance with CEQA requirements. Under CEQA, lead agencies are required to adopt a program for monitoring or reporting on the revisions which they required to be made part of the project, and other measures required to mitigate or avoid significant environmental effects. An MMRP for implementation of the proposed project will be developed to comply with CEQA. The mitigation measures which were identified as part of this analysis, and which will be included in the MMRP, are listed in Appendix F.

Significant Effects

CEQA establishes a duty for public agencies to avoid or minimize environmental damage where feasible (CEQA Guidelines Section 15021), and determinations of significance play a critical role in the CEQA process (CEQA Guidelines 15064). Potentially significant effects associated with implementation of the proposed project have been identified in the areas of:

- Air Quality
- Biological Resources
- Cultural and Tribal Cultural Resources
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Soils, Geology and Minerals
- Wildfires

These potential effects are discussed in the individual resource sections in this document. As part of the environmental impact assessment for each resource area, mitigation measures have been identified which reduce potential impacts to less-than-significant levels. The environmental analysis conducted for the proposed project did not identify any effects that, after mitigation, remained significant and therefore unavoidable. No significant irreversible effects were identified associated with the proposed project.

4.0 Consultation and Coordination

Tribes, Agencies, and Organizations Contacted or Consulted

Letters were sent to Native American tribes in accordance with Section 106 of the NHPA. The California State Historic Preservation Officer is being consulted with, in accordance with Section 106 of the NHPA, regarding the project. NMFS and USFWS are being consulted with, in accordance with Section 7 of the ESA and CDFW is being consulted with, in accordance with the CESA, regarding the project.

Public Comments

An initial public scoping notice was published in the legal section of the Red Bluff Daily News on May 31, 2019. No comments were received.

5.0 Compliance with Environmental Laws and Regulations

The following environmental laws and regulations will be complied with, as applicable, for the proposed project:

Table 10. Compliance with Environmental Laws and Regulations	
Environmental Law / Regulation	**Agency**
Bald and Golden Eagle Protection Act	U.S. Fish and Wildlife Service
California Endangered Species Act	California Department of Fish and Wildlife
California Environmental Quality Act	Resource Conservation District of Tehama County
California Fish and Game Code Section 1600	California Department of Fish and Wildlife
California Water Code Sections 8710-8723	Central Valley Flood Protection Board
Clean Air Act	Tehama County Air Pollution Control District
Clean Water Act Section 401	Central Valley Regional Water Quality Control Board
Clean Water Act Section 402, National Pollution Discharge Elimination System – Construction Activities Storm Water General Permit	State Water Resources Control Board
Clean Water Act Section 404	U.S. Army Corps of Engineers
Endangered Species Act Section 7	National Marine Fisheries Service U.S. Fish and Wildlife Service
Magnuson-Stevens Fishery Conservation and Management Act	National Marine Fisheries Service
Migratory Bird Treaty Act	U.S. Fish and Wildlife Service
National Environmental Policy Act	U.S. Fish and Wildlife Service
National Historic Preservation Act Section 106	State Historic Preservation Officer
Executive Order 11990 Protection of Wetlands	U.S. Fish and Wildlife Service
Executive Order 11988 Floodplain Management	U.S. Fish and Wildlife Service
Executive Order 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations	U.S. Environmental Protection Agency

6.0 List of Preparers and Participants

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Appendix A: 100% Design Plan Drawings
Appendix B: Potentially-occurring Special-status Vascular Plant Species
Appendix C: Vascular Plant Species Observed Within or Near the Project Site
Appendix D: Potentially-occurring Special-status Faunal Species
Appendix E: Faunal Species Observed Within or Near the Project Site
Appendix F: List of Mitigation Measures
Appendix G: CEQA Environmental Checklist Form
Appendix H: Greenhouse Gas Emissions Inventory