FINAL
Environmental Assessment / Initial Study
and
Finding of No Significant Impact / Mitigated Negative Declaration

Clover Creek / Millville Diversion Fisheries Restoration Project

State Clearinghouse #201508206

Millville, California

December 2015

Federal Lead Agency for NEPA
U.S. Fish and Wildlife Service
2800 Cottage Way, Room W-2606
Sacramento, California 95825

Project Proponent and State Lead Agency for CEQA
Western Shasta Resource Conservation District
6270 Parallel Road
Anderson, California 96007

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List of Acronyms and Abbreviations

AFRP	Anadromous Fish Restoration Program
AFSP	Anadromous Fish Screen Program
AP	Agricultural Preserve
BA	Biological Assessment
BMP	Best Management Practice
BOR	U.S. Department of the Interior, Bureau of Reclamation
CALFED	CALFED Bay-Delta Program
CAL FIRE	California Department of Forestry and Fire Protection
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCR	California Code of Regulations
CCWMG	Cow Creek Watershed Management Group
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CDWR	California Department of Water Resources
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
CH_4	Methane
CHP	California Highway Patrol
CNDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
CO_2	Carbon Dioxide
CV	Central Valley
CVPIA	Central Valley Project Improvement Act
DDT	Dichlorodiphenyltrichloroethane
DOORS	Diesel Off-Road On-Line Reporting System
DPS	Distinct Population Segment
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
EA	Exclusive Agriculture
EA / IS	Environmental Assessment / Initial Study
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Study
EPA	U.S. Environmental Protection Agency
ERP	CALFED Bay-Delta Program Ecosystem Restoration Program Plan
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas
HDPE	High-density Polyethylene
IPS	Iron Pipe Size
HEC-RAS	Hydrologic Engineering Center River Analysis System
LEQ	Energy-Equivalent Level

MMRP	Mitigation Monitoring and Reporting Program
MDC	Millville Ditch Company
MDD	Millville Diversion Dam
MND	Mitigated Negative Declaration
N_2O	Nitrous Oxide
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NHC	Northwest Hydraulic Consultants, Inc.
NMFS	National Marine Fisheries Service
NRCS	U.S. Department of Agriculture, Natural Resources Conservation Service
PCE	Primary Constituent Element
PERP	Portable Equipment Registration Program
PM_{10}	Particulate Matter less than 10 Microns in Diameter
RAGB	Redding Area Groundwater Basin
RPMs	Resource Protection Measures
RSP	Rock Slope Protection
RWQCB	Central Valley Regional Water Quality Control Board
SCAQMD	Shasta County Air Quality Management District
SDR	Standard Dimension Ratio
SR	State Route
SRH-2D	Sedimentation and River Hydraulics Two-dimensional Model
SSP	Statistical Software Package
SWPPP	Storm Water Pollution Prevention Plan
TAC	Project Technical Advisory Committee
TDS	Total Dissolved Solids
TES	Tehama Environmental Solutions, Inc.
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDA-SCS	U.S. Department of Agriculture - Soil Conservation Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VELB	Valley Elderberry Longhorn Beetle
WHR	Wildlife Habitat Relationships
WSRCD	Western Shasta Resource Conservation District

Finding of No Significant Impact
Clover Creek/Millville Diversion Fisheries Restoration Project

Lead Federal Agency:
U.S. Fish and Wildlife Service
Pacific Southwest Region
2800 Cottage Way, Room W-2606
Sacramento, CA 95825

Introduction

In accordance with the National Environmental Policy Act of 1969, as amended (NEPA), the U.S. Fish and Wildlife Service (USFWS) and local project sponsor Western Shasta Resource Conservation District (WSRCD) prepared a Draft Environmental Assessment (EA)/Initial Study (IS) for the Clover Creek/Millville Diversion Fisheries Restoration Project (Proposed Action), dated August 2015. Since the EA/IS was originally prepared, the proposed start date for construction has changed from July 1 to June 1, however, this does not change the conclusions of the EA/IS or result in any changes to recommended resource protection measures. Based on the analyses in the EA/IS (August 2015), the USFWS concludes that a Finding of No Significant Impact (FONSI) is appropriate.

Proposed Action

The USFWS proposes to grant funds under the authority of the Central Valley Project Improvement Act's (CVPIA) Anadromous Fish Screen Program (AFSP) for the Proposed Action. The Proposed Action supports objectives of the AFSP and the California Department of Fish and Wildlife (CDFW) Ecosystem Restoration Program (ERP), as well as complements other ongoing efforts to improve important aquatic habitats for the benefit of naturally producing anadromous salmonids in the Central Valley. The Proposed Action is also being funded by a grant from CDFW ERP.

The Proposed Action includes improving fish passage conditions that currently hinder fish passage in Clover Creek by constructing fish ladders at the Millville Diversion Ditch (MDD), constructing a fish screen and bypass pipe at the MDD, replacing the siphon structure, and adding scour protection to protect the infrastructure at the site while continuing to address the water needs of the landowners and the Millville Ditch Company (MDC), owners of the infrastructure. The Proposed Action also includes gravel augmentation at one site downstream of the MDD and siphon, near a low-water crossing.

The Proposed Action will meet the following project goals:

1. Improve fish passage at the MDD and siphon;
2. Reduce the risk of entrainment of fish in the diversion;
3. Improve spawning habitat within Clover Creek;
4. Address MDC's water needs; and
5. Minimize maintenance needs for public agencies and the MDC.

Findings

Based upon information contained in the EA/IS, the USFWS has determined that the Proposed Action is not a major Federal action and would not significantly affect the quality of the natural and human environment. The EA/IS describes the existing environmental resources in the Proposed Action area, evaluates the effects of the No Action and Proposed Action alternatives on those resources, and proposes measures to avoid, minimize, or mitigate any negative effects. Effects on several environmental resources were examined and found to be absent or minor. This analysis is provided in the EA/IS, and is hereby incorporated by reference. The basis for a Finding of No Significant Impact is as follows:

1. The EA/IS has identified short-term, minor impacts to wildlife and fisheries that 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 provide unimpeded salmonid fish passage during most flows, to reduce the risk of entrainment of fish in the diversion and to improve spawning habitat within Clover Creek. The Proposed Action would remediate the current passage impediment and risk of entrainment by constructing fish ladders at both the siphon and MDD and screening the Millville diversion. This would allow salmonids to reach ten additional miles of upstream holding, spawning, and rearing habitat. The Proposed Action would also improve spawning habitat within Clover Creek.

2. Impacts to special-status species, including California Central Valley steelhead and valley elderberry longhorn beetle would be avoided or minimized by implementing the measures identified in the EA/IS and a Biological Assessment (July 31, 2015, with November 23, 2015 amendment). On November 23, 2015 and December 10, 2015, the USFWS received written concurrences from the National Marine Fisheries Service and the USFWS, respectively, that the Proposed Action is not likely to adversely affect species listed as threatened or endangered, or critical habitats, designated under the Federal Endangered Species Act.

3. Resource protection measures have been incorporated into the Proposed Action as project design features to minimize adverse effects on air quality, hazardous waste materials, hydrology and water quality, noise and soils and geology.

4. The Proposed Action is not expected to have adverse effects on wetlands or floodplains pursuant to Executive Orders 11990 and 11988.

5. 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.

6. Based on field surveys and a cultural resources evaluation, the Proposed Action would not significantly affect cultural resources. The USFWS entered into consultation with the California State Historic Preservation Officer (SHPO) seeking concurrence on a finding of "no historic properties affected". SHPO concurred with this finding on August 5, 2015. However, unknown subsurface cultural resources could be impacted during ground disturbing activities associated with the proposed project.

An individual knowledgeable in identifying cultural resources would be present during any ground disturbing activities. In the event subsurface cultural remains over 45 years of age are encountered, the project would cease work at the general area of discovery and the contractor will consult with a professional archaeologist on staff with the USFWS.

Public Review and Comment

An initial public scoping notice was published in the legal section of the Redding Record Searchlight on March 28, 2013 and no comments were received. The Draft EA/IS was circulated through the State Clearinghouse for a 30 day public review on September 1, 2015. Concurrent with this public review, a public notice was published in the legal section of the Redding Record Searchlight on September 1, 2015 to solicit additional comments from the public and interested parties. No comments were received regarding the content of the Draft EA/IS.

Conclusion

The USFWS, as lead Federal agency for the proposed Clover Creek/Millville Diversion Fisheries Restoration Project, has determined that the Proposed Action does not constitute a major Federal action significantly affecting the quality of the human environment under the meaning of section 102(2)(c) of NEPA. As such, an Environmental Impact Statement is not required. The USFWS concludes that, with the implementation of measures to avoid, minimize, or mitigate any negative effects, the Proposed Action will result in no significant impacts to the quality of the human environment, individually or cumulatively with other actions in the general area.

Cesar C. Blanco,
CVPIA Program Administrator
Pacific Southwest Region
U.S. Fish and Wildlife Service

12/17/15
Date

MITIGATED NEGATIVE DECLARATION
PROJECT TITLE:

CLOVER CREEK / MILLVILLE DIVERSION FISHERIES RESTORATION PROJECT

Project Description

The Western Shasta Resource Conservation District (WSRCD) has proposed a fish passage improvement project on Clover Creek at a site that currently hinders fish passage, known as the Millville diversion dam (MDD), herein referred to as the project. The project includes improving fish passage conditions by constructing fish ladders at the MDD and an associated siphon, constructing a fish screen and bypass pipe at the MDD, replacing the siphon structure, adding scour protection to improve fish passage and adding spawning gravel to Clover Creek while continuing to address the water needs of the Millville Ditch Company (MDC), the owners of the infrastructure. Improving fish passage through this project, would improve anadromous fish access to spawning, rearing and holding stream habitat upstream of the project site through installation of fish ladders and would improve fish passage downstream of the project site through installation of a fish screen and bypass pipe. The project also includes gravel augmentation at one site downstream of the siphon, near the low-water crossing to improve spawning habitat for native fish within Clover Creek. The project is being funded by the California Department of Fish and Wildlife (CDFW) through the Ecosystem Restoration Program (ERP) and the U.S. Fish and Wildlife Service (USFWS) through the Anadromous Fish Screen Program (AFSP). The project supports objectives of the AFSP and ERP, 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 California Central Valley steelhead (which are listed as threatened under the Endangered Species Act) and Central Valley fall- and late fall-run Chinook salmon which are a state Species of Special Concern and a National Marine Fisheries Service (NMFS) Species of Concern. Improving fish passage at this site would restore anadromous fish access to an additional ten miles of historic spawning, rearing and holding stream habitat. The USFWS is the lead agency under the National Environmental Policy Act. The WSRCD is the lead agency for the project under the California Environmental Quality Act.

Findings

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

- The project would result in a net benefit to Chinook salmon, steelhead and other aquatic fish and wildlife species by improving upstream and downstream passage conditions and providing access to ten miles of historic upstream anadromous fish holding, spawning and rearing habitat.
- Project impacts would be temporary in nature.
- The project would eliminate the risk of entrainment of native fish into the diversion system
- The project would improve spawning habitat within Clover Creek.
- The project incorporates all applicable mitigation measures, as listed below and described in the EA / IS.

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:** A Fugitive Dust Permit will be obtained from the Shasta County Air Quality Management District (SCAQMD).
- **AIR-2:** All construction equipment will be maintained in proper tune according to manufacturer's specifications.
  To the extent feasible, the use of diesel construction equipment meeting the California Air Resources Board's (CARB) 1996 or newer certification standard for off-road heavy-duty diesel engines will be maximized.
  If required by the SCAQMD, verify that owners or operators of vehicles are registered with the California Air Resources Board Diesel Off-Road On-Line Reporting System (DOORS) program: (www.arb.ca.gov/msprog/ordiesel/ordiesel.htm). The DOORS program assists fleet owners in reporting their off-road diesel vehicle inventories to reduce vehicle emissions, as required by the In-Use Off-Road Diesel Regulation.
  If required by the SCAQMD, verify that owners or operators of portable engines and certain other types of equipment are registered under the California Air Resources Board's Statewide Portable Equipment Registration Program (PERP) in order to operate their equipment throughout California without having to obtain individual permits from local air districts: (www.arb.ca.gov/portable/portable.htm).
- **VEGETATION-1:** Disturbance to riparian vegetation and other existing vegetation will be avoided or minimized to the extent possible.
- **VEGETATION-2:** All heavy equipment shall be thoroughly cleaned prior to mobilization onsite to remove any soil, weed seeds and plant parts in order to reduce the importation and spread of invasive non-native plant species.
- **VEGETATION-3:** Only certified weed-free straw shall be used for erosion control or other purposes to reduce the importation and spread of invasive non-native plant species.
- **VEGETATION-4:** A revegetation plan will be prepared to replace impacted riparian wetlands and riparian habitat by a measure of quantity and quality equal to, or exceeding impacts of the project or as required by regulatory permit conditions, using appropriate native riparian trees and shrubs.
- **VEGETATION-5:** Areas with woody vegetation that have been disturbed will be revegetated in accordance with the revegetation plan.
- **VEGETATION-6:** Whenever feasible, existing trees within the alignment shall be left in place. All trees to be removed shall be clearly marked on the project plan sheets.
- **VEGETATION-7:** No smoking will be allowed on the construction site or within the Action Area, for fire prevention purposes.
- **WILDLIFE-1:** Prior to work in aquatic habitats, water bodies shall be surveyed by a qualified biologist to determine if any foothill yellow-legged frogs or western pond turtles are present. If any individuals of these species are found, a qualified and permitted biologist shall determine and implement appropriate relocation procedures. Herpetological exclusion fencing shall be erected around the perimeter of the instream work areas prior to construction initiation. Exclusionary fencing shall be maintained daily and remain until work in aquatic habitats is complete.
- **WILDLIFE-2:** A qualified biologist experienced in the identification of amphibian species (particularly Rana species) will conduct survey(s) for California red-legged frogs at a frequency / rate deemed acceptable by the California Department of Fish and Wildlife (CDFW) to determine if this species is present within any of the disturbance areas. If any California red-legged frogs are found to be present, all potentially disturbing construction activities will be suspended until appropriate protective measures can be developed in consultation with the U.S. Fish and Wildlife Service (USFWS) Endangered Species Act (ESA) staff.
- **WILDLIFE-3:** Prior to the initiation of construction, a survey to identify active bald eagle nests within 0.50 mile (as access allows) of project construction, shall be conducted by a qualified biologist. If

active bald eagle nests are found to be present, tree removal, vegetation clearing and the onset of potentially disturbing construction activities shall be suspended until the qualified biologist, in consultation with CDFW and USFWS, makes a determination as to whether construction work will affect the active nest or disrupt reproductive behavior and whether appropriate protective buffer areas or monitoring will be required to minimize impacts to nesting bald eagles. No construction activities should commence within established buffer areas until the qualified biologist determines that the nest is not active or the juvenile birds have fledged and are no longer using the nest as their primary day and / or night roost.
Trees with unoccupied eagle nests shall not be removed.

- **WILDLIFE-4:** Any tree removal, vegetation clearing, or the onset of potentially disturbing construction activities shall occur between August 31 and January 1 (outside of the nesting season for avian species).
  If tree removal, vegetation clearing, or the onset of potentially disturbing construction activities must occur during the nesting season for non-raptor avian species (March 1 through July 31), a nesting survey of the construction area and adjacent suitable habitat shall be conducted by a qualified biologist no more than seven days prior to the initiation of the onset of these activities. If active avian 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 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.
  If tree removal, vegetation clearing, or the onset of potentially disturbing construction activities must occur during the raptor nesting season January 1 through August 31, a raptor nesting survey of the construction area and a 0.25 mile buffer (as access allows) shall be conducted by a qualified biologist no more than seven days prior to the initiation of the onset of these activities. 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 should commence within the buffer area until the qualified biologist determines that the young birds have fledged or the nest is no longer active.
- **WILDLIFE-5:** Prior to any construction work, a survey shall be conducted by a qualified biologist to ensure that pallid bats are not roosting within the areas to be disturbed.
  If pallid bats are found to be roosting within the area to be disturbed, construction activities shall be suspended until a qualified biologist, in consultation with CDFW, can establish appropriate measures to minimize impacts to pallid bats.
- **WILDLIFE-6:** Prior to construction, a qualified biologist will inspect the area to be disturbed to determine if potential ringtail denning is occurring.
  If potential ringtail denning is found to be occurring, construction activities should be suspended until a qualified biologist, in consultation with CDFW, can establish appropriate measures to minimize impacts to ringtail.
- **WILDLIFE-7:** 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 should 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-8:** 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 potentially significantly impacted by the project in the environmental documents.

- **WILDLIFE-9:** Aquatic habitat preservation: Embedded pieces of large woody debris or the stumps of existing trees that can potentially serve as basking sites and/or encourage pool formation shall be left in place whenever possible. If removal is determined to be necessary (none anticipated), large woody debris, large flat boulders, or stumps will be replaced with structures of equal or greater habitat value.
- **WILDLIFE-10:** To reduce potential impacts to valley elderberry longhorn beetle (VELB) to less than significant levels, the proposed project shall comply with 1999 USFWS Conservation Guidelines for the Valley Elderberry Longhorn Beetle, or as directed by the results of the Endangered Species Act Section 7 consultation with the USFWS.
  Prior to construction, biological surveys for potential habitat, not identified in previous VELB surveys shall be completed.
  All elderberry shrubs within 100 ft. of the Project Area boundary will be clearly flagged, and the flags will be maintained throughout the duration of the Project's construction. If access to the shrub is difficult due to dense riparian growth, then the boundary of the riparian stand will be clearly flagged, whichever is more protective of the elderberry shrub.
  All elderberry shrubs that are within 50 ft. of Project activity will be clearly fenced; the purpose of the fencing and fencing specs (e.g. color of fencing) shall be clearly shared with construction employees and staff.
  If elderberry shrubs cannot be avoided then the mitigation guidelines in the USFWS 1999 Conservation Guidelines for the Valley Elderberry Longhorn Beetle will be followed or mitigation credits will be purchased from a USFWS-approved mitigation bank.
  Any revegetation efforts will consider and incorporate use of elderberries in the planting mix, where appropriate.
- **WILDLIFE-11**: As close to the beginning of construction as possible, but not more than 14 days prior to construction, a qualified biologist shall conduct a final pre-activity survey of the construction zone to ensure that no other special-status wildlife species have recently occupied the site, including at a minimum those species described as potentially occurring, and species listed in the California Wildlife Habitat Relationship Program list generated for this project by CDFW. If special status species nests or roosting sites are found, a services-approved biologist shall be employed to determine and implement appropriate relocation procedures or exclusion zones, in coordination with regulatory agencies. If special-status species are found during the pre-construction survey, the biologist will be present immediately prior to construction activities that have the potential to impact special-status species to identify and protect potentially sensitive resources. In addition, special status wildlife species captured during fish removal activities (see FISH-3) will be carefully located either above the dam / upper water crossing OR below the low water crossing so that potential impacts to these species are minimized.
- **WILDLIFE-12**: 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 and could include such measures as physical removal from equipment, freezing equipment and saturation of equipment in a chemical solution(s).
- **WILDLIFE-13**: Exclusionary devices approved by CDFW and / or USFWS, shall be installed on the bridge near the siphon by February 15 to exclude swallows from nest building. The exclusion measures shall be monitored and maintained at a frequency sufficient to ensure that nest building is not occurring and to ensure there are no open entry points.
  If exclusionary devices fail to exclude swallow nesting, all traces of nesting precursors (mud placed by swallows for construction of nests) shall be continuously removed, including new and old nesting materials. Any nest shall be removed at the first sign of nest building and before the nest reaches a

size which could hold any eggs. Nest removal shall not result in the destruction of any eggs or completed nests or cause harm to adult swallows or any other birds.
If a swallow nest with eggs and / or young birds are found, work must stop until a no-disturbance buffer is established and marked in the field in coordination with CDFW. All exclusionary devices shall be removed after project completion.

- **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 or other aquatic habitats 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 (Central Valley Water Board) for the project and all permit / certification conditions and all agreements will be adhered to.
- **WETLAND-5**: A California Fish and Game Code Section 1600 Lake and Streambed Alteration Agreement will be obtained from CDFW for the project.
- **FISH-1**: All instream construction work shall be conducted between July 1 and October 14. Water diversions can occur before May 31, or as flows allow. Work within the channel and banks, outside of this instream work window must be isolated from flowing water, and fish passage will be accommodated through the project site after October 14.
- **FISH-2**: All construction debris already on site and generated as a result of construction activity (concrete, metal, etc.) from the fish passage improvement-related construction activities will be removed from the active stream channel post-construction.
- **FISH-3**: Prior to construction, exclusionary fish netting shall be installed upstream and downstream of the construction area. Specifically, a net will be installed above and below the dam/upper water crossing; above and below the siphon / bridge, and above and below the lower water crossing. Best professional determination will be used to decide which method(s) of rescue and location of exclusionary netting is most appropriate. 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, the National Marine Fisheries Service (NMFS) electrofishing guidelines (NMFS 2000) will be strictly followed. The fish rescue team will be comprised of fishery biologists with professional experience using seines and electrofishing equipment.
- **FISH-4**: All dewatering and rewatering activities will be conducted slowly, in order to minimize disturbance to fish.
- **FISH-5**: All pumps used during dewatering or other construction activities will be screened to meet CDFW and NMFS criteria.
- **CULTURAL-1**: In the event subsurface cultural remains over 45 years of age 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).
- **SOIL / GEO-1**: After ground-disturbing activities are complete, all disturbed areas (outside of the active stream channel) shall be seeded with native plant species and mulched as described in the revegetation plan.

- **SOIL / GEO-2**: Construction of all project actions shall comply with RWQCB Basin Plan Objectives. Standard Best Management Practices (BMPs) will be incorporated into the project designs and / or Stormwater Pollution Prevention Plan (SWPPP), if required.
- **SOIL / GEO-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 Stormwater Associated with Construction Activity and a SWPPP will be prepared.
- **SOIL / GEO-4**: For site grading, on-site materials may be used as engineered fill, provided they are prepared free of organics, trash and other debris, they do not contain oversize particles larger than 2.5 inches in greatest dimension, they have no more than 35 percent passing the No. 200 sieve, they have little to no corrosion potential and have a relatively low expansion potential, defined by a liquid limit less than 40 and a plasticity index lower than 20. If imported fill is used, it shall be submitted to the geotechnical engineer of record for approval at least 72 hours before it is to be used on site.
  Compaction Requirements: Engineered fill, where planned, shall be placed in maximum eight-inch-thick loose lifts, moisture-conditioned to within two percent of optimum moisture content, and compacted to at least 90 percent relative compaction. Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density of the same material, as determined by ASTM D1557 laboratory compaction procedure. (Source: Sage Engineers 2015)
- **SOIL / GEO-5**: Where temporary excavations are required, temporary slopes will be used. Temporary slopes shall be excavated in accordance with the latest edition of the CAL-OSHA excavation and trench safety standards as a minimum (OSHA 2012, OSHA Standards for the Construction Industry, 29 CFR Part 1926). The sand / gravel / cobble matrix present at the site shall be preliminarily classified as Type C according to the CAL-OSHA classification system. The maximum allowable slope for Type C soil is 1.5H:1V; however, flatter temporary slopes may be required to provide a stable slope, especially where there are low fines contents. Where encountered, bedrock shall be classified as Stable Rock, for which vertical cuts are allowed; however this shall be confirmed in the field once exposed. The Contractor is responsible for all temporary slopes at the site, and shall designate one of their on-site employees as a "competent person" who is responsible for trench and excavation safety. The competent person shall be responsible for determination of the actual CAL-OSHA soil type and shall direct the excavation crews to adjust slope inclinations if appropriate. If temporary shoring is used, the Contractor shall retain the services of a design engineer familiar with shoring system design in creek deposits. (Source: Sage Engineers 2015)
- **SOIL / GEO-6**: Where permanent cut and fill slopes are required in soil, they shall be constructed with a maximum inclination of 2H:1V. Cut slopes in the bedrock shall be excavated to inclinations of 1H:1V, but shall be confirmed in the field by a Certified Engineering Geologist during construction based on the actual conditions encountered. Steeper permanent slopes in rock cuts may be feasible as determined by the Geologist. (Source: Sage Engineers 2015)
- **SOIL / GEO-7**: All creek crossings associated with construction / project activity shall occur only at the two designated low water crossings
- **HAZ-1**: A designated concrete washout area will be located at least 100 feet from any high water mark within adjacent waterways and will be developed and used following the Standard California Department of Transportation Temporary Concrete Washout Plan.
- **HAZ-2**: Construction equipment and building materials shall not be stored or stockpiled in the creek channel, and shall be stored at least 50 feet from the top of the bank.
- **HAZ-3**: No petroleum-based products shall be used as soil stabilizing material.
- **WATER-1**: All construction shall be conducted in the summer / early fall during the low flow period. 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**: BMPs will be developed and implemented to ensure that wet concrete does not enter Clover Creek during construction.
- **WATER-3**: Monitoring of water turbidity and settleable materials shall be conducted in accordance with the Clean Water Act Section 401 Certification through consultation with the Central Valley Water Board.
- **WATER-4**: 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-5**: All equipment refueling and / or maintenance shall take place within a secondary containment structure and a minimum of 100 feet away from Clover Creek or other aquatic sites.
- **WATER-6**: An emergency spill kit and absorbent oil booms will be onsite during construction activities.
- **WATER-7**: All equipment operations within the channel and banks of Clover Creek will be required to use readily biodegradable hydraulic oil.
- **WATER-8**: A dewatering permit will be obtained from the Central Valley Water Board for each project site, if deemed necessary, based on the dewatering methods used.
- **NOISE-1**: Construction work (including arrival and departure of trucks hauling materials) will generally be conducted from 7:00 am to 7:00 pm Monday through Friday. Weekend work will only be allowed, if necessary to complete the projects within the established environmental time frames.

The proposed project would have a less-than-significant impact or no impact as related to aesthetics, agricultural resources, cumulative impacts, environmental justice, land use / planning, mineral resources, population and housing, public services, public utilities, recreation, and transportation.

Potential project impacts would be reduced to a level of less-than-significant through adherence to established best management practices and implementation of mitigation measures related to air quality, biological resources, cultural resources, hazardous waste materials, hydrology and water quality, noise and soils and geology.

Phil Schoefer

Mr. Phil Schoefer, Board President
Western Shasta Resource Conservation District

10-14-15
Date

Project Title:

Clover Creek / Millville Diversion Fisheries Restoration Project

Lead Agencies Name and Address:

The project applicant is the Western Shasta Resource Conservation District (WSRCD). The U.S. Fish and Wildlife Service is the lead agency under the National Environmental Policy Act. The WSRCD is the lead agency under the California Environmental Quality Act. Contact information for the lead agencies is listed below:

U.S. Fish and Wildlife Service

Mr. Dan Meier
U.S. Fish and Wildlife Service
2800 Cottage Way, Room W-2606
Sacramento, California 95825
(916) 414-6725
Dan_Meier@fws.gov

Western Shasta Resource Conservation District

Ms. Maureen Teubert
Western Shasta Resource Conservation District
6270 Parallel Rd.
Anderson, California 96007
(530) 365-7332 x 207
Maureen@westernshastarcd.org

Project Location:

The proposed project is located in the foothills of the northern Sacramento Valley, approximately 20 miles east of Palo Cedro, in Shasta County, California. The project site is located on private property in the Clover Creek watershed, a sub-watershed of the Cow Creek watershed in Section 6, Township 31 North, Range 2 West and Section 1, Township 31 North, Range 3 West.

General Plan Designation:

The Shasta County General Plan designation for the site is Commercial Agriculture, Agriculture – Grazing – Prime Agriculture.

Zoning:

The Shasta County zoning designation for the project site is Exclusive Agricultural District and Agricultural Preserve District.

1.0 Introduction

1.1 Overview

Originally formed under the CALFED Bay-Delta Program (CALFED), the Ecosystem Restoration Program (ERP) is a multi-agency effort aimed at improving and increasing aquatic and terrestrial habitats and ecological function in the Sacramento and San Joaquin River Delta and its tributaries. Funding for ERP is provided from both state and federal sources. The ERP focus area includes the Sacramento River below Shasta Dam and major tributary watersheds directly connected to the Bay-Delta system below major dams and reservoirs, such as Clover Creek, a sub-watershed of the Cow Creek watershed. Principal participants overseeing the ERP are California Department of Fish and Wildlife (CDFW), formerly the California Department of Fish and Game (CDFG), the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS), collectively known as the ERP Implementing Agencies. The ERP and other ecosystem restoration programs have recommended improving facilitated passage, spawning habitat conditions and riparian habitat in the Cow Creek watershed as a priority, because Cow Creek supports Central Valley fall- / late fall-run Chinook salmon *(Oncorhynchus tshawytscha),* as well as California Central Valley Steelhead *(Oncorhynchus mykiss)*. The project is being funded primarily by the ERP and also by the USFWS Anadromous Fish Screen Program (AFSP).

Under the authority of the Central Valley Project Improvement Act (CVPIA), the USFWS has developed the 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. The CVPIA, Section 3406 b(b)(21), authorizes the Secretary of Interior to implement measures to avoid losses of juvenile anadromous fish in support of restoring fishery populations in the California Central Valley. These measures are funded through the AFSP and can include construction of fish screens. USFWS in coordination with the Bureau of Reclamation (BOR) implements the AFSP.

The Western Shasta Resource Conservation District (WSRCD) has proposed a fish passage improvement project (hereafter referred to as project, proposed project or Proposed Action) on Clover Creek at a site known as the Millville Diversion Dam (MDD). Improving fish passage at this site would restore anadromous fish access to an additional ten miles of historic spawning, rearing and holding stream habitat. Additionally, agencies such as the California Department of Water Resources (DWR), California Department of Fish and Wildlife (CDFW), formerly the California Department of Fish and Game (CDFG), USFWS, the Natural Resources Conservation Service (NRCS) and WSRCD have also provided funding for previous project tasks accomplished in the planning phases and would work collaboratively to conduct project monitoring activities as described further in Section 2.0, Proposed Actions.

1.2 Purpose of This Document

This Joint Environmental Assessment / Initial Study (EA / IS) was prepared by Tehama Environmental Solutions, Inc. (TES) under subcontract to WSRCD, under agreement with CDFW and USFWS. The EA / IS has been prepared to comply with both NEPA (42 U.S.C. 4331 *et seq.*) and CEQA (California Pub. Res. Code, Sections 21000 *et seq.*). USFWS is the lead agency under NEPA and WSRCD 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 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.

1.3 Project Location

The Proposed Action is located in the foothills of the Sacramento Valley, approximately 12 miles east of Redding, in Shasta County, California (Figure 1 through 3). The project is located in Clover Creek, 3.5 stream miles upstream of the confluence with the mainstem of Cow Creek and approximately 13.5 miles upstream of the Cow Creek and Sacramento River confluence. Photos of the project site are provided as Figures 4 through 9.

The proposed project is located on three remote private parcels which comprises the entire project and the unpaved access haul roads to reach the project. The Shasta County Assessor's Parcel Numbers are 093-010-001, 060-200-020 and 093-020-001.

1.4 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 the USFWS and WSRCD are considering the proposed project.

<u>Purpose</u>

The purpose of the Proposed Action is to improve anadromous fish passage conditions at the MDD, reduce the risk of fish entrainment in the diversion and improve spawning habitat within Clover Creek, while continuing to meet the Millville Ditch Company's (MDC) water needs.

<u>Need</u>

The ERP is guided by the following six strategic goals; 1. To recover endangered and other at-risk species and native biotic communities; 2. Rehabilitate ecological processes; 3. Maintain or enhance harvested species populations; 4. Protect and restore habitats; 5. Prevent the establishment of, and reduce impacts from non-native invasive species; and 6. Improve or maintain water and sediment quality. The proposed project directly addresses the ERP planning goals one through four, and Milestones 67 and 72 to improve, expand, and address the recovery of listed species, special habitats, and anadromous fish.

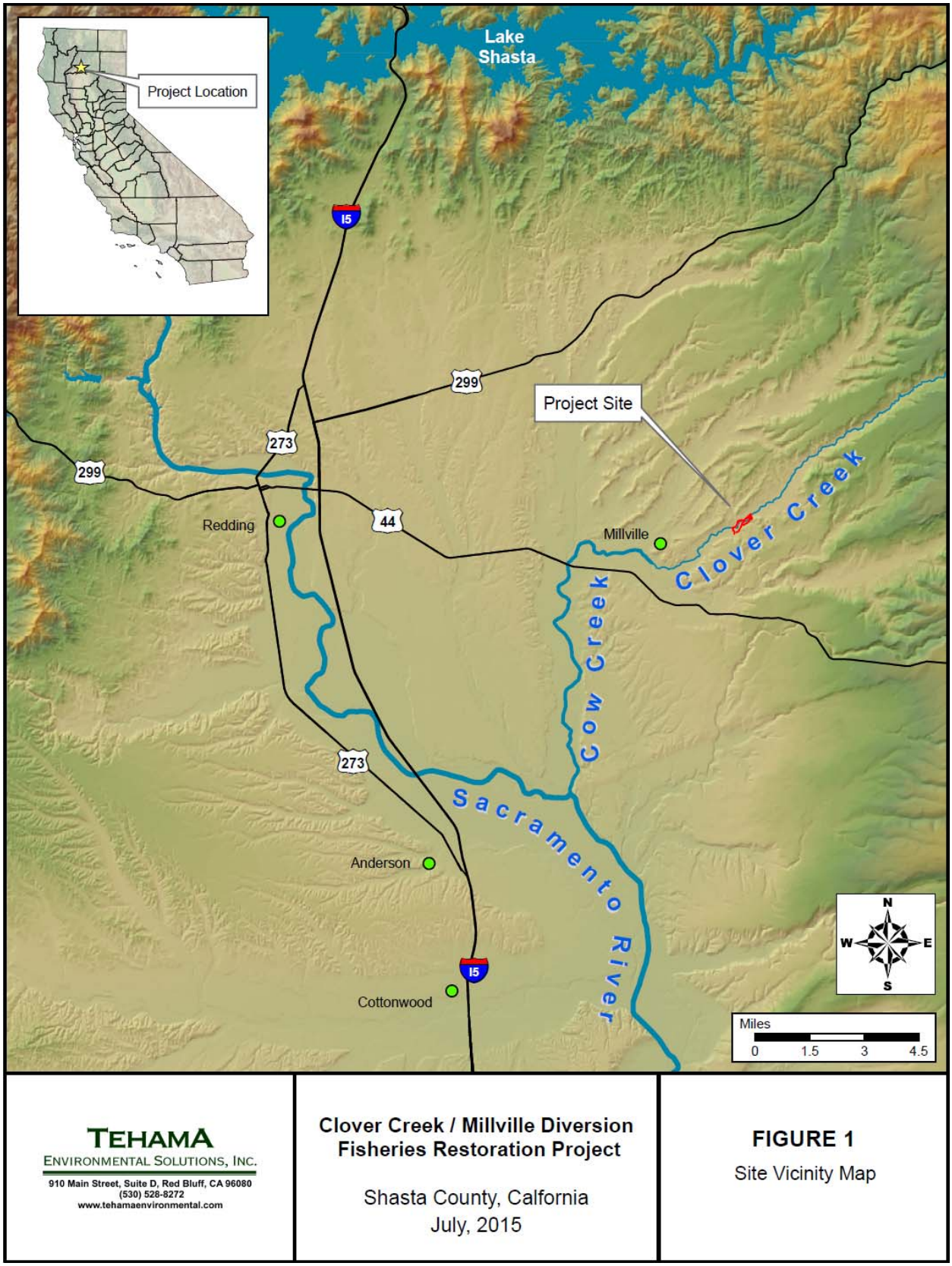


Figure 1. Site Vicinity Map

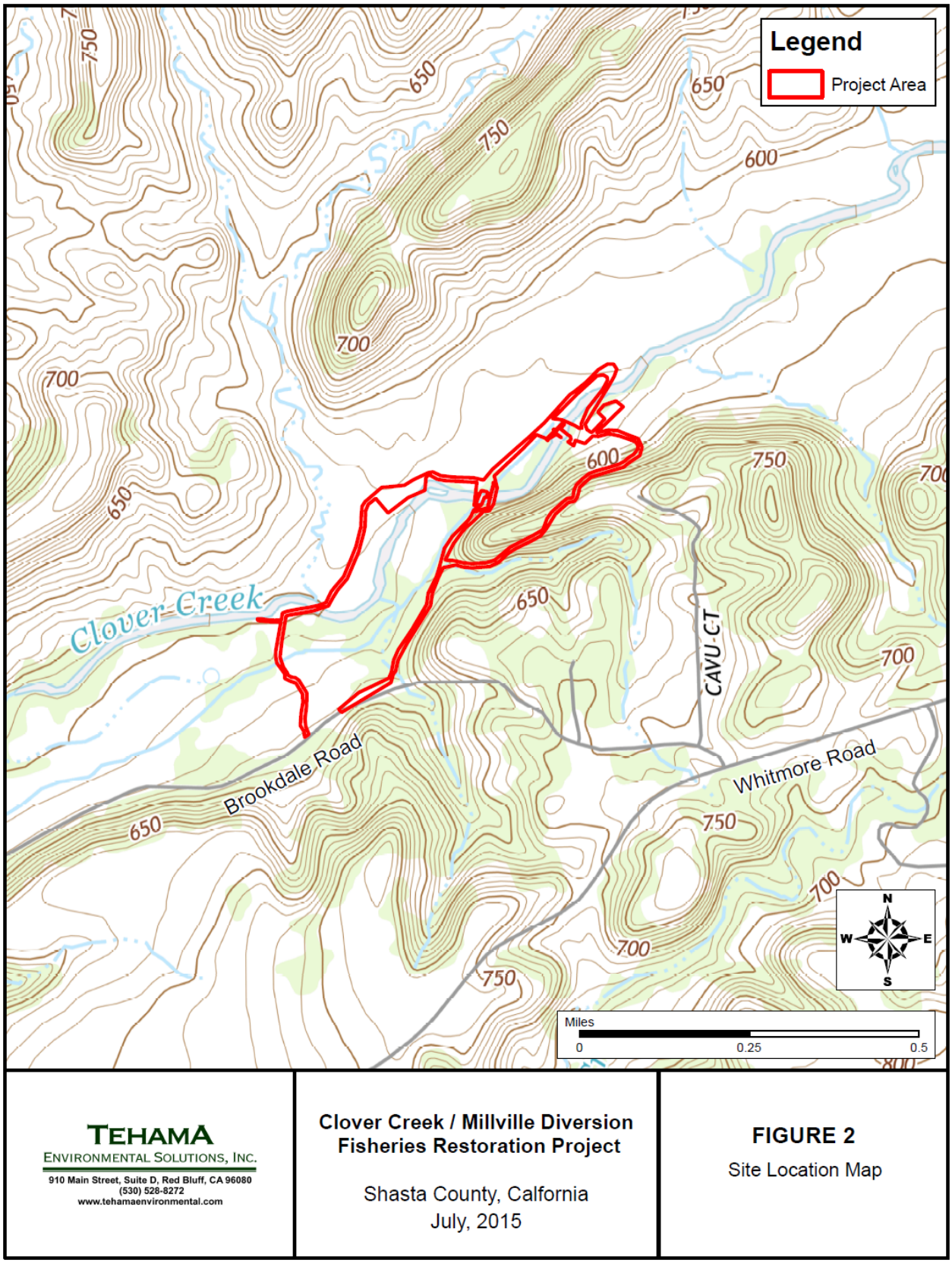
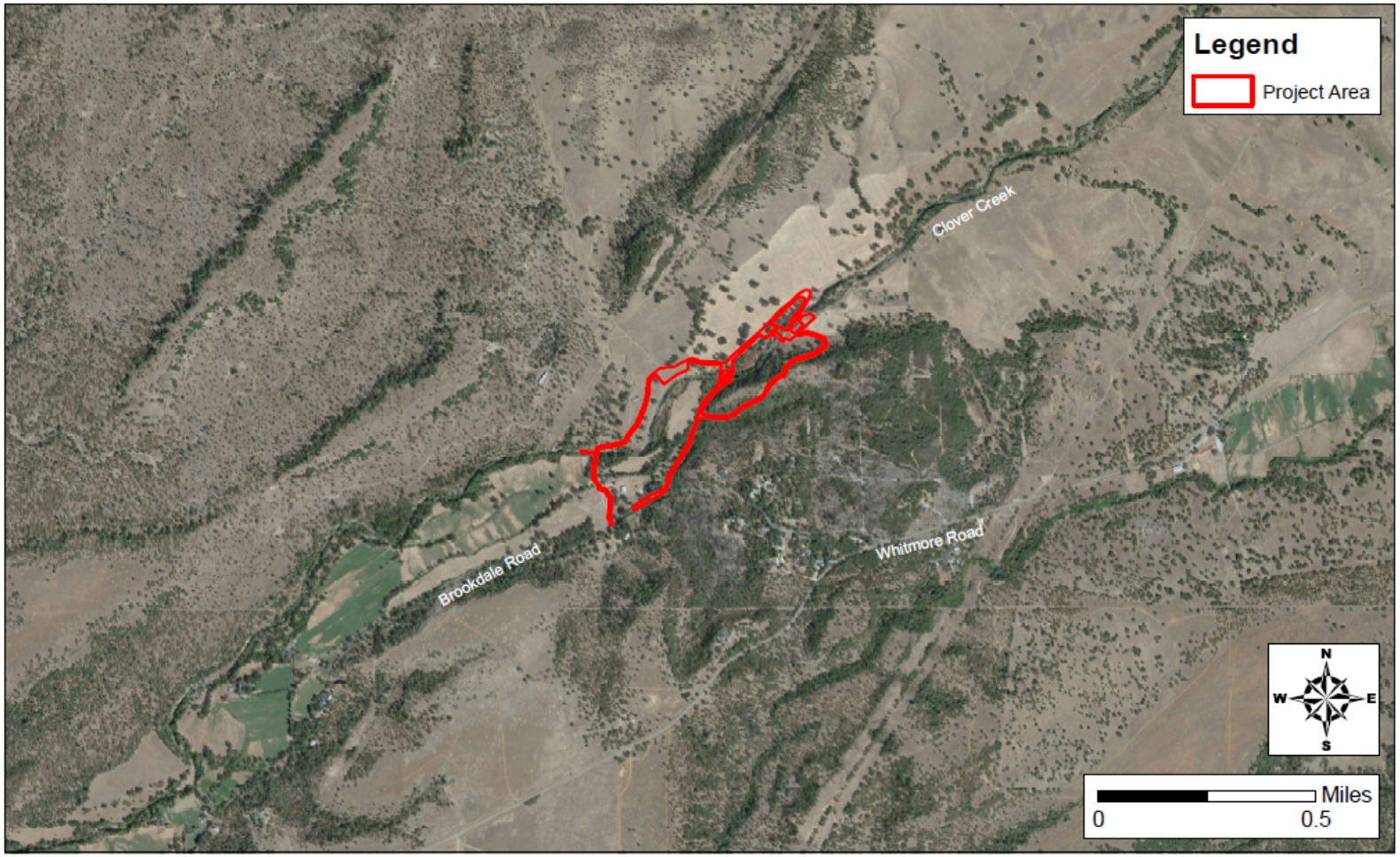


Figure 2. Site Location Map



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

Clover Creek / Millville Diversion Fisheries Restoration Project

Shasta County, Calfornia
July, 2015

FIGURE 3

Site Aerial Photo

Figure 3. Site Aerial Photo

Figure 4. View of the Millville Diversion Dam

View of the Millville diversion dam and intake structure, looking northwest.

Photo date: June 26, 2007.

Figure 5. View of the Millville Diversion Dam on the North Bank

View of the Millville diversion dam, spillway and diversion structure, looking north.

Photo date: November 6, 2014.

Figure 6. View Upstream of the Millville Diversion Dam

View upstream of the Millville diversion dam looking northeast towards the upper crossing.

Photo date: September 5, 2012.

Figure 7. View of the Siphon

View of the exposed siphon and access bridge, looking southeast.

Photo date: June 26, 2007.

Figure 8. View of the Low Water Crossing

View of the low water crossing at the gravel augmentation site, looking north. The area downstream of the crossing (to the left) is the gravel augmentation site.

Photo date: September 5, 2012.

Figure 9. View of the Gravel Augmentation Site

View of the gravel augmentation site, located immediately downstream of the lower crossing, looking west.

Photo Date: June 28, 2013.

USFWS and other ecosystem restoration programs have recommended improving fish passage in Central Valley streams as a high priority for the CVPIA. One of the High Priority Actions in the *Final Restoration Plan for the Anadromous Fish Restoration Program* (AFRP) (USFWS 2001) included "Encourage the restoration of small tributaries by evaluating the feasibility of screening or relocating diversions, switching to alternative sources of water for upstream diversions, replacing bridge and ford combinations with bridges or larger culverts and installing siphons to prevent truncation of small streams at irrigation canals." The project directly addresses Endangered Species Act (ESA) recovery goals for steelhead and actions as identified in the CVPIA and the AFRP Final Restoration Plan (USFWS 2001).

The AFSP was established in 1994 to carry out Section 3406(b)(21) of the CVPIA. CVPIA (Title 34 of Public Law 102-575) required implementation of measures to protect, restore, and enhance fish and wildlife affected by operations of the federal Central Valley Project. The AFSP has identified the MDD as a potential site for improving passage conditions for several species of anadromous fish by protecting juvenile anadromous fish from entrainment in the water diversion at the project site.

The MDD and associated siphon are both estimated to have been constructed in the 1930s and neither have fish ladders or any other type of fish passage features associated with the structures. The MDD is also currently unscreened. The MDD has been determined to be a fish passage barrier to Chinook salmon and steelhead under all flow conditions (T. Bratcher pers. comm.). The diversion at the site is unscreened and poses a risk for entrainment of fish in the diversion canal. The siphon has been determined to be a fish passage barrier to Chinook salmon and steelhead under some flow conditions as fish can negotiate passing over the structure at certain flows, but are potentially injured in the process (Bratcher 2015).

Improving fish passage at this site is needed to enable adult anadromous fish to access an additional ten stream miles of historic upstream spawning, rearing and holding habitat upstream, as well as to enable unimpeded bypass for adult and juvenile anadromous fish during downstream migrations.

The MDD is part of a private stream diversion system that supplies irrigation water for agricultural and residential uses through the MDC. There is a continued need by the MDC for water, so the project must be designed to meet this need.

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

- Improve fish passage at the MDD and siphon;
- Reduce the risk of entrainment of fish in the diversion;
- Improve spawning habitat within Clover Creek;
- Meet the MDC's water needs; and
- Minimize maintenance needs for public agencies and the MDC

1.5 Clover Technical Advisory Committee

The project was developed through a collaborative process by the Clover Creek / Millville Diversion Fisheries Restoration Project Technical Advisory Committee (TAC), comprised of representatives from BOR, CDFW, Central Valley Regional Water Quality Control Board (RWQCB), Cow Creek Watershed Management Group (CCWMG), DWR, MDC, NMFS, NRCS, USFWS, WSRCD, multiple private landowners and several private consulting firms. The project is being funded by a grant from the CDFW ERP and USFWS AFSP.

1.6 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 5.0, 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 as represented in 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	
California Endangered Species Act	California Department of Fish and Wildlife
Clean Water Act Section 401 Water Quality Certification	Central Valley Regional Water Quality Control Board
Construction General Stormwater Permit*	California State Water Resources Control Board
National Historic Preservation Act Section 106 Consultation	California Office of Historic Preservation
Lake or Streambed Alteration Agreement	California Department of Fish and Wildlife
NPDES Dewatering And Other Low Threat Discharges To Surface Waters Permit**	Central Valley Regional Water Quality Control Board
LOCAL	
Building and Grading Permits***	Shasta County Resource Management Department
Shasta County Fugitive Dust Permit	Shasta County Air Quality Management District

*May be required if the project is determined to cause disturbance to one or more acres of soil.
**May be required depending on the method of dewatering proposed.
*** May be required.

2.0 Proposed Action and Alternatives

2.1 Alternative Development

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

Since 2005, the TAC has held meetings, multiple field visits, tours and discussions with the landowner and the MDC 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 rights investigations, topographic surveys, hydrologic and hydraulic surveys, geologic investigations, botanical surveys, wetland delineations, habitat assessments, structural analysis surveys, wildlife surveys, archaeological surveys and environmental reviews. DWR completed an engineering technical report which included an alternatives analysis (Snodgrass 2013) to identify solutions for improving fish passage at the MDD and siphon structures. Alternatives were discussed and ideas pursued or discarded based on merit and group consensus until a preferred alternative was selected. DWR documented the findings of the analysis in the *Clover Creek / Millville Diversion Fish Passage Project Preliminary Engineering Technical Report* (Snodgrass 2013).

DWR worked closely with the TAC to develop design criteria, select preferred alternatives, and to advance the selected alternatives to 50 percent engineering design documents.

The report alternatives that were described and discussed by the TAC included:

1. TAC Alternative 1: Dam and Siphon Removal – This alternative consisted of removal of the dam and siphon structures, installation of a fish friendly pump in the channel, replacement of the bridge and installation of solar panels to offset power costs relating to pumping.
2. TAC Alternative 2: Natural Channel – This alternative consisted of construction of a natural channel over the existing dam and siphon using step-pool structures and screening the existing diversion.
3. TAC Alternative 3: Fish Ladders – This alternative consisted of installation of a fish ladder and fish screen at the MDD, excavation of the MDC ditch on the north bank of Clover Creek, replacement of pipe in the MDC diversion infrastructure on the north bank of Clover Creek, installation of a fish ladder over the siphon, replacement of the siphon, installation of rock scour protection below MDD and the siphon, and the gravel augmentation.

Northwest Hydraulic Consultants (NHC) was contracted by WSRCD to provide final engineering design documents for the project. NHC staff and its subcontractors then gathered information for the engineering alternatives analysis to provide fish passage improvements at the MDD and siphon along with other components of the Proposed Action, and also completed numerical modeling of the expected 100-year peak flow event to analyze project impacts and design scour protection.

2.2 Alternative 1 – No Action

Under this alternative, no changes would occur to the existing MDD, siphon or other diversion-related infrastructure at each site. No changes would occur to any of the existing structures or diversion practices at the site. Provisions for improved passage and protection of fishes would not be implemented. The hydraulic characteristics of the flows over the MDD and siphon would continue to be deficient in meeting NMFS and CDFW fish passage criteria during most flows. The siphon would continue to act as a partial temporal upstream barrier with fish passing over the siphon at certain flows, while potentially incurring injuries in the process. The MDD would continue to act as a complete barrier to adult salmonids under any flow conditions for upstream passage. Unscreened flows would continue to be diverted and adult and juvenile downstream migrant fish would continue to be at risk of entrainment into the diversion. No water system modifications would be necessary because the current diversion structure would continue to meet the water needs of the landowner.

2.3 TAC Alternative 3 – Proposed Action

TAC members agreed that the preferred alternative would involve:

- Installation of a fish ladder and fish screen at the MDD site
- Excavation of the MDC ditch on the north bank of Clover Creek at the MDD site
- Replacement of pipe in the MDC diversion infrastructure on the north bank of Clover Creek at the MDD site
- Installation of a fish ladder over the existing siphon
- Reconstruction of a new siphon
- Installation of rock scour protection below both the MDD and the siphon
- Gravel augmentation

This alternative was then further developed through a design process (Appendix A). An agreement is currently being coordinated and prepared between the CDFW, MDC and the landowner that memorializes responsibility for maintaining the condition of the fish screen and bypass pipe and for keeping the diversion in a fish-friendly operational state.

Millville Diversion Dam

Below is a bulleted list of the Proposed Action design features followed by a more detailed description of each aspect of the action. The 100 percent design plans are included in Appendix A.

- Dewater the construction areas
- Demolition of the existing diversion pipe and headwall
- Construction of a new fish ladder, fish screen, diversion pipe and headwall
- Installation of dam rock scour protection

Siphon

- Dewater the construction areas
- Installation of a new siphon
- Abandonment of the existing siphon
- Construction of a new fish ladder
- Installation of siphon rock scour protection

Gravel Augmentation

- Injection of 1,000 tons of gravel to an approximately 200-foot reach of channel downstream of the low water crossing, downstream of the siphon for improvement of salmonid spawning habitat

Project Monitoring

- Salmonid habitat surveys
- Salmonid carcass and redd surveys
- Avian surveys
- Water quality monitoring (pre- and during project implementation)
- Geomorphic analyses (pre- and post-project)
- Photo documentation (pre- and post-project)
- Video fish weir monitoring (pre- and post-project)

Other Project Considerations

- Revegetation

- Fish ladder and screen maintenance
- Project timing
- Additional project construction details

Millville Diversion Dam

The proposed rehabilitation of the MDD would include demolition of the existing diversion pipe and headwall; construction of a new fish ladder and fish screen structure on the north bank; excavation of the MDC ditch on the north bank and installation of a new diversion pipe; addition of concrete fill to the undermined areas of the MDD for support and installation of rock scour protection.

Dewater the Construction Areas

A CDFW-approved stream diversion and dewatering plan describing the materials and methods used to install and maintain stream diversions and dewatering activities would be provided by the construction contractor. Stream diversions would be sized to accommodate flows up to seven cubic feet per second (cfs) without undue erosion. Design of temporary coffer dams would maintain a depth of water as shown on the plans. All temporary cofferdams and diversions would be removed completely at the end of construction. Diversion to provide agricultural irrigation would occur throughout the proposed construction period.

Demolition of the Existing Diversion Pipe and Headwall

The existing diversion pipe and headwall would be demolished. Existing features that would remain in place would be protected from damage, including any internal structures protecting the existing pipe, any structures associated with the footings of the dam that new construction would be tied into and the ditch beyond the extent of the new pipe.

Construction of a New Fish Ladder, Fish Screen, Diversion Pipe and Headwall

The fish ladder is designed to have low operational and maintenance needs while providing adequate fish passage in accordance with CDFW and NMFS criteria. The ladder design is based on a high-flow design of 400 cfs and a low-flow design of three cfs for the creek. The reinforced concrete fish ladder would comprise a chute-pool configuration, including ten weirs with equal drops. The upstream weir will have a notch height of 0.75 feet with channels for placing flash boards across the notch. This would allow the crest to be raised to 560.1, allowing MDC to divert all remaining streamflow as is their current operation. When approximately 20 cfs or more, is passing the diversion, the water surface elevation at the diversion will be adequate to divert 6.5 cfs. Therefore, the fishway could be operated without boards when total flow upstream of the diversion is greater than 26.5 cfs. The north bank side wall would have a constant top of wall elevation of 571.0 feet in order to prevent debris from flowing into the ladder during high flow events (i.e., a 100-year storm). At the downstream end of the ladder, a retaining wall would continue along the north bank, an additional 32 feet, with a top of wall elevation of 561.0 feet to match existing grades. A drainage swale would be constructed on the bank perpendicular to the downstream wall to accept overtopping flows.

The reinforced concrete fish screen structure would be comprised of a metal fish screen, a motorized brush system powered by solar panels and a headgate leading into the new diversion pipe. The structure would also include flashboards at the screen to control the flow into the structure.

The diversion pipe would be a buried, 24-inch diameter, corrugated, dual-wall, High Density Polyethylene (HDPE) pipe with an invert elevation of 560.0 feet. The HDPE pipe would tie into the existing ditch.

Installation of Dam Rock Scour Protection

Using appropriate methods, concrete would be added to fill the eroded area under the face of the dam structure to promote the longevity of the constructed fish passage structure. Caltrans Class B Rock Slope Protection (RSP) fabric would be placed at the bottom of the scour area at the toe of the dam. A six-inch layer of angular six-inch rock would cover the fabric. One-half ton RSP riprap / large rock would cover the area to armor the toe of the dam. A rock harvest area adjacent to the creek was formerly proposed as part of the project site (former rock harvest area); however the TAC ultimately decided not to include it into the final project area.

Siphon

The proposed rehabilitation of the siphon would include abandonment of the existing siphon and addition of concrete fill inside of it, installation of a new siphon upstream of the existing bridge; construction of a new fish ladder and installation of rock scour protection.

Dewater the Construction Areas

A CDFW-approved stream diversion and dewatering plan describing the materials and methods used to install and maintain stream diversions and dewatering activities would be provided by the construction contractor. Stream diversions would be sized to accommodate flows up to seven cfs without undue erosion. Design of temporary coffer dams would maintain a depth of water as shown on the plans. All temporary cofferdams and diversions would be removed completely at the end of construction.

Diversion to provide agricultural irrigation would occur throughout the proposed construction period. A temporary screened pump would be installed near the siphon to supply water directly into the diversion ditch on the south side of the creek.

Installation of a New Siphon

The new siphon would be a 26-inch Iron Pipe Size (IPS) Standard Dimension Ratio (SDR) 32.5 HDPE pipe. The siphon would be encased in cement slurry and would terminate at the new reinforced concrete inlet and outlet structures. The inlet structure would have a trash rack to capture large debris and a slide gate to control flow inside the pipe.

Abandonment of Existing Siphon

The existing siphon structure would be abandoned and filled with cement slurry. The current siphon inlet structure would be removed along with the first 25 feet of siphon pipe and a portion of the concrete apron downstream of the siphon.

Construction of a New Fish Ladder

The reinforced concrete 39-foot-long fish ladder would be comprised of a chute-pool configuration including six weirs with equal drops. The fish ladder is designed to have low operational and maintenance needs, while providing adequate fish passage in accordance with CDFW and NMFS salmonid requirements. The ladder design is based on a high-flow design of 400 cfs and a low-flow design of three cfs for the creek.

Installation of Siphon Rock Scour Protection

Large rock would be placed downstream of the siphon to provide additional stability and to address water flow patterns over the entire structure in a way that minimizes unsuitable geomorphological conditions. Caltrans Class B RSP fabric would also be placed at the bottom of the scour area at the toe of the existing concrete structure. A six-inch layer of angular six-inch rock would cover the fabric. One-

half ton RSP riprap / large rock would cover the area to armor the toe of the siphon. Riprap armoring is designed to protect the existing and new structures during a 100-year storm event with creek flows up to 7,000 cfs.

Gravel Augmentation

Up to 1,000 tons of appropriately sized and washed gravel would be placed immediately downstream of the low water crossing, approximately 500 yards downstream of the siphon between the thalweg (the deepest area of the streambed) and the northern bank of the creeks. The gravel would provide additional spawning habitat within Clover Creek. Gravel would be placed as a 100-foot-long and eight-foot-wide berm, parallel to the flow, within the channel and would avoid any impact to riparian vegetation.

Project Monitoring

Various agencies including DWR, USFWS, NRCS, WSRCD and subcontractors would work collaboratively to conduct project monitoring activities. Project monitoring would consist of the following tasks:

- Salmonid habitat surveys;
- Salmonid carcass and redd surveys;
- Avian surveys;
- Water quality monitoring (pre- and during project implementation);
- Geomorphic analyses (pre- and post-project);
- Photo documentation (pre- and post-project); and
- Video fish weir monitoring (pre- and post-project);

Other Project Considerations

Revegetation

A revegetation plan would be prepared for this project to replace impacted vegetation by a measure of quantity and quality equal to or exceeding impacts of the project using appropriate native species. Following construction, vegetated areas that have been disturbed, would be revegetated in accordance with the revegetation plan.

Fish Ladder and Screen Maintenance

The fish ladders and fish screen would require some level of maintenance beyond the duration of the project. Fish ladder cleaning could include conducting work by hand, and also utilize heavy equipment to remove large debris after large storm events (likely ranging from October to May). Screen maintenance would potentially include sediment accumulation and debris removal and removal of the screens to repair them and would likely occur during non-irrigation periods (November to April). The timeframes of this work and additional details, are proposed to occur when little to no impacts would occur to anadromous salmonids. Screen maintenance tasks are being coordinated between WSRCD, CDFW and the MDC, owners of the diversion infrastructure. Ultimately, the structures would be owned by MDC.

Project Timing

Construction work would take place in 2016, with a construction start date of July 1 and ending by October 14. All potential gravel augmentation is proposed to occur between August 1 and October 14.

Additional Project Construction Details

A revegetation plan would be prepared for this project to replace impacted vegetation by a measure of quantity and quality equal to or exceeding impacts of the project using appropriate native species.

Following construction, vegetated areas that have been disturbed, would be revegetated in accordance with the revegetation plan.

The construction staging areas are located immediately adjacent to both the MDD and siphon. Construction staging will not encroach on any sensitive areas, and all construction equipment and materials will be stored, maintained, and operated according to the established Best Management Practices (BMPs) in the *Clover Creek / Millville Diversion Fisheries Restoration Project Clover Creek Watershed Biological Assessment* (Bratcher 2015) and Mitigation Measures described in Appendix G. Proposed Action construction would be limited to the period between July 1 and October 14.

All potential removal of vegetation and trees from the Action Area will occur in the fall or early spring prior to the bird nesting season of the year in which construction will occur. Prior to the initiation of construction activities, a preconstruction survey by a CDFW and/or USFWS approved biologist will be completed to ensure that no special-status wildlife and/or plant species have recently occupied the site. Fish exclusion nets will be installed upstream and downstream of the site prior to commencement of work. The size of mesh will be determined by the amount of steam flow. The smallest mesh that can be set, and stay in place, across the creek successfully will be used. A fisheries crew with appropriate permits will relocate any native fish and amphibian species between the exclusion nets prior to working in the creek. Techniques used may include seining, dip-netting, and/or electro-fishing. This will be conducted at a time when steelhead are not present (with oversight by CDFW). Erosion control elements such as silt fences and straw wattles will be placed per the erosion control plan prior to the initiation of construction.

2.3.1 Requirements and Mitigations Incorporated into the Proposed Action

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

AIR-1: A Fugitive Dust Permit will be obtained from the Shasta County Air Quality Management District (SCAQMD).

AIR-2: All construction equipment will be maintained in proper tune according to manufacturer's specifications.

To the extent feasible, the use of diesel construction equipment meeting the California Air Resources Board's (CARB) 1996 or newer certification standard for off-road heavy-duty diesel engines will be maximized.

If required by the SCAQMD, verify that owners or operators of vehicles are registered with the California Air Resources Board Diesel Off-Road On-Line Reporting System (DOORS) program: (www.arb.ca.gov/msprog/ordiesel/ordiesel.htm). The DOORS program assists fleet owners in reporting their off-road diesel vehicle inventories to reduce vehicle emissions, as required by the In-Use Off-Road Diesel Regulation.

If required by the SCAQMD, verify that owners or operators of portable engines and certain other types of equipment are registered under the California Air Resources Board's Statewide Portable Equipment Registration Program (PERP) in order to operate their equipment throughout California without having to obtain individual permits from local air districts: (www.arb.ca.gov/portable/portable.htm).

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

VEGETATION-2: All heavy equipment shall be thoroughly cleaned prior to mobilization onsite to remove any soil, weed seeds and plant parts in order to reduce the importation and spread of invasive non-native plant species.

VEGETATION-3: Only certified weed-free straw shall be used for erosion control or other purposes to reduce the importation and spread of invasive non-native plant species.

VEGETATION-4: A revegetation plan will be prepared to replace impacted riparian wetlands and riparian habitat by a measure of quantity and quality equal to, or exceeding impacts of the project or as required by regulatory permit conditions, using appropriate native riparian trees and shrubs.

VEGETATION-5: Areas with woody vegetation that have been disturbed will be revegetated in accordance with the revegetation plan.

VEGETATION-6: Whenever feasible, existing trees within the alignment shall be left in place. All trees to be removed shall be clearly marked on the project plan sheets.

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

WILDLIFE-1: Prior to work in aquatic habitats, water bodies shall be surveyed by a qualified biologist to determine if any foothill yellow-legged frogs or western pond turtles are present. If any individuals of these species are found, a qualified and permitted biologist shall determine and implement appropriate relocation procedures. Herpetological exclusion fencing shall be erected around the perimeter of the instream work areas prior to construction initiation. Exclusionary fencing shall be maintained daily and remain until work in aquatic habitats is complete.

WILDLIFE-2: A qualified biologist experienced in the identification of amphibian species (particularly *Rana* species) will conduct survey(s) for California red-legged frogs at a frequency / rate deemed acceptable by the CDFW to determine if this species is present within any of the disturbance areas. If any California red-legged frogs are found to be present, all potentially disturbing construction activities will be suspended until appropriate protective measures can be developed in consultation with the USFWS ESA staff.

WILDLIFE-3: Prior to the initiation of construction, a survey to identify active bald eagle nests within 0.50 mile (as access allows) of project construction, shall be conducted by a qualified biologist. If active bald eagle nests are found to be present, tree removal, vegetation clearing and the onset of potentially disturbing construction activities shall be suspended until the qualified biologist, in consultation with CDFW and USFWS, makes a determination as to whether construction work will affect the active nest or disrupt reproductive behavior and whether appropriate protective buffer areas or monitoring will be required to minimize impacts to nesting bald eagles. No construction activities should commence within established buffer areas until the qualified biologist determines that the nest is not active or the juvenile birds have fledged and are no longer using the nest as their primary day and / or night roost.

Trees with unoccupied eagle nests shall not be removed.

WILDLIFE-4: Any tree removal, vegetation clearing, or the onset of potentially disturbing construction activities shall occur between August 31 and January 1 (outside of the nesting season for avian species).

If tree removal, vegetation clearing, or the onset of potentially disturbing construction activities must occur during the nesting season for non-raptor avian species (March 1 through July 31), a nesting survey of the construction area and adjacent suitable habitat shall be conducted by a qualified biologist no more than seven days prior to the initiation of the onset of these activities. If active avian 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 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.

If tree removal, vegetation clearing, or the onset of potentially disturbing construction activities must occur during the raptor nesting season January 1 through August 31, a raptor nesting survey of the construction area and a 0.25 mile buffer (as access allows) shall be conducted by a qualified biologist no more than seven days prior to the initiation of the onset of these activities. 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 should commence within the buffer area until the qualified biologist determines that the young birds have fledged or the nest is no longer active.

WILDLIFE-5: Prior to any construction work, a survey shall be conducted by a qualified biologist to ensure that pallid bats are not roosting within the areas to be disturbed.

If pallid bats are found to be roosting within the area to be disturbed, construction activities shall be suspended until a qualified biologist, in consultation with CDFW, can establish appropriate measures to minimize impacts to pallid bats.

WILDLIFE-6: Prior to construction, a qualified biologist will inspect the area to be disturbed to determine if potential ringtail denning is occurring.

If potential ringtail denning is found to be occurring, construction activities should be suspended until a qualified biologist, in consultation with CDFW, can establish appropriate measures to minimize impacts to ringtail.

WILDLIFE-7: 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 should 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-8: 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 potentially significantly impacted by the project in the environmental documents.

WILDLIFE-9: Aquatic habitat preservation: Embedded pieces of large woody debris or the stumps of existing trees that can potentially serve as basking sites and/or encourage pool formation shall be left in place whenever possible. If removal is determined to be necessary (none anticipated), large woody debris, large flat boulders, or stumps will be replaced with structures of equal or greater habitat value.

WILDLIFE-10: To reduce potential impacts to valley elderberry longhorn beetle (VELB) to less than significant levels, the proposed project shall comply with 1999 USFWS *Conservation Guidelines for the Valley Elderberry Longhorn Beetle*, or as directed by the results of the Endangered Species Act Section 7 consultation with the USFWS.

Prior to construction, biological surveys for potential habitat, not identified in previous VELB surveys shall be completed.

All elderberry shrubs within 100 ft. of the Project Area boundary will be clearly flagged, and the flags will be maintained throughout the duration of the Project's construction. If access to the shrub is difficult due to dense riparian growth, then the boundary of the riparian stand will be clearly flagged, whichever is more protective of the elderberry shrub.

All elderberry shrubs that are within 50 ft. of Project activity will be clearly fenced; the purpose of the

fencing and fencing specs (e.g. color of fencing) shall be clearly shared with construction employees and staff.

If elderberry shrubs cannot be avoided then the mitigation guidelines in the USFWS 1999 *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* will be followed or mitigation credits will be purchased from a USFWS-approved mitigation bank.

Any revegetation efforts will consider and incorporate use of elderberries in the planting mix, where appropriate.

WILDLIFE-11: As close to the beginning of construction as possible, but not more than 14 days prior to construction, a qualified biologist shall conduct a final pre-activity survey of the construction zone to ensure that no other special-status wildlife species have recently occupied the site, including at a minimum those species described as potentially occurring, and species listed in the California Wildlife Habitat Relationship Program list generated for this project by CDFW. If special status species nests or roosting sites are found, a services-approved biologist shall be employed to determine and implement appropriate relocation procedures or exclusion zones, in coordination with regulatory agencies. If special-status species are found during the pre-construction survey, the biologist will be present immediately prior to construction activities that have the potential to impact special-status species to identify and protect potentially sensitive resources. In addition, special status wildlife species captured during fish removal activities (see FISH-3) will be carefully located either above the dam / upper water crossing OR below the low water crossing so that potential impacts to these species are minimized.

WILDLIFE-12: 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 and could include such measures as physical removal from equipment, freezing equipment and saturation of equipment in a chemical solution(s).

WILDLIFE-13: Exclusionary devices approved by CDFW and / or USFWS, shall be installed on the bridge near the siphon by February 15 to exclude swallows from nest building. The exclusion measures shall be monitored and maintained at a frequency sufficient to ensure that nest building is not occurring and to ensure there are no open entry points.
If exclusionary devices fail to exclude swallow nesting, all traces of nesting precursors (mud placed by swallows for construction of nests) shall be continuously removed, including new and old nesting materials. Any nest shall be removed at the first sign of nest building and before the nest reaches a size which could hold any eggs. Nest removal shall not result in the destruction of any eggs or completed nests or cause harm to adult swallows or any other birds.
If a swallow nest with eggs and / or young birds are found, work must stop until a no-disturbance buffer is established and marked in the field in coordination with CDFW. All exclusionary devices shall be removed after project completion.

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 or other aquatic habitats 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 (Central Valley Water Board) for the project and all permit / certification conditions and all agreements will be adhered to.

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

FISH-1: All instream construction work shall be conducted between July 1 and October 14. Water diversions can occur before May 31, or as flows allow. Work within the channel and banks, outside of this instream work window must be isolated from flowing water, and fish passage will be accommodated through the project site after October 14.

FISH-2: All construction debris already on site and generated as a result of construction activity (concrete, metal, etc.) from the fish passage improvement-related construction activities will be removed from the active stream channel post-construction.

FISH-3: Prior to construction, exclusionary fish netting shall be installed upstream and downstream of the construction area. Specifically, a net will be installed above and below the dam/upper water crossing; above and below the siphon / bridge, and above and below the lower water crossing. Best professional determination will be used to decide which method(s) of rescue and location of exclusionary netting is most appropriate. 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, the National Marine Fisheries Service (NMFS) electrofishing guidelines (NMFS 2000) will be strictly followed. The fish rescue team will be comprised of fishery biologists with professional experience using seines and electrofishing equipment.

FISH-4: All dewatering and rewatering activities will be conducted slowly, in order to minimize disturbance to fish.

FISH-5: All pumps used during dewatering or other construction activities will be screened to meet CDFW and NMFS criteria.

CULTURAL-1: In the event subsurface cultural remains over 45 years of age 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).

SOIL / GEO-1: After ground-disturbing activities are complete, all disturbed areas (outside of the active stream channel) shall be seeded with native plant species and mulched as described in the revegetation plan.

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

SOIL / GEO-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 Stormwater Associated with Construction Activity and a SWPPP will be prepared.

SOIL / GEO-4: For site grading, on-site materials may be used as engineered fill, provided they are prepared free of organics, trash and other debris, they do not contain oversize particles larger than 2.5 inches in greatest dimension, they have no more than 35 percent passing the No. 200 sieve, they have little to no corrosion potential and have a relatively low expansion potential, defined by a liquid limit less than 40 and a plasticity index lower than 20. If imported fill is used, it shall be submitted to the geotechnical engineer of record for approval at least 72 hours before it is to be used on site.

Compaction Requirements: Engineered fill, where planned, shall be placed in maximum eight-inch-thick loose lifts, moisture-conditioned to within two percent of optimum moisture content, and compacted to at least 90 percent relative compaction. Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density of the same material, as determined by ASTM D1557 laboratory compaction procedure. (Source: Sage Engineers 2015)

SOIL / GEO-5: Where temporary excavations are required, temporary slopes will be used. Temporary slopes shall be excavated in accordance with the latest edition of the CAL-OSHA excavation and trench safety standards as a minimum (OSHA 2012, OSHA Standards for the Construction Industry, 29 CFR Part 1926). The sand / gravel / cobble matrix present at the site shall be preliminarily classified as Type C according to the CAL-OSHA classification system. The maximum allowable slope for Type C soil is 1.5H:1V; however, flatter temporary slopes may be required to provide a stable slope, especially where there are low fines contents. Where encountered, bedrock shall be classified as Stable Rock, for which vertical cuts are allowed; however this shall be confirmed in the field once exposed. The Contractor is responsible for all temporary slopes at the site, and shall designate one of their on-site employees as a "competent person" who is responsible for trench and excavation safety. The competent person shall be responsible for determination of the actual CAL-OSHA soil type and shall direct the excavation crews to adjust slope inclinations if appropriate. If temporary shoring is used, the Contractor shall retain the services of a design engineer familiar with shoring system design in creek deposits. (Source: Sage Engineers 2015)

SOIL / GEO-6: Where permanent cut and fill slopes are required in soil, they shall be constructed with a maximum inclination of 2H:1V. Cut slopes in the bedrock shall be excavated to inclinations of 1H:1V, but shall be confirmed in the field by a Certified Engineering Geologist during construction based on the actual conditions encountered. Steeper permanent slopes in rock cuts may be feasible as determined by the Geologist. (Source: Sage Engineers 2015)

SOIL / GEO-7: All creek crossings associated with construction / project activity shall occur only at the two designated low water crossings.

HAZ-1: A designated concrete washout area will be located at least 100 feet from any high water mark within adjacent waterways and will be developed and used following the Standard California Department of Transportation Temporary Concrete Washout Plan.

HAZ-2: Construction equipment and building materials shall not be stored or stockpiled in the creek channel, and shall be stored at least 50 feet from the top of the bank.

HAZ-3: No petroleum-based products shall be used as soil stabilizing material.

WATER-1: All construction shall be conducted in the summer / early fall during the low flow period. 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: BMPs will be developed and implemented to ensure that wet concrete does not enter Clover Creek during construction.

WATER-3: Monitoring of water turbidity and settleable materials shall be conducted in accordance with the Clean Water Act Section 401 Certification through consultation with the Central Valley Water Board.

WATER-4: 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-5: All equipment refueling and / or maintenance shall take place within a secondary containment structure and a minimum of 100 feet away from Clover Creek or other aquatic sites.

WATER-6: An emergency spill kit and absorbent oil booms will be onsite during construction activities.

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

WATER-8: A dewatering permit will be obtained from the Central Valley Water Board for each project site, if deemed necessary, based on the dewatering methods used.

NOISE-1: Construction work (including arrival and departure of trucks hauling materials) will generally be conducted from 7:00 am to 7:00 pm Monday through Friday. Weekend work will only be allowed, if necessary to complete the projects within the established environmental time frames.

2.4 Alternatives Considered but Dismissed

Two additional alternatives were considered by the TAC but were dismissed due to the following reasons (Snodgrass 2013).

TAC Alternative 1 - Dam and Siphon Removal

This alternative consisted of removing the MDD and siphon structures, installing a fish friendly pump in the channel, replacing the bridge and installing solar panels to offset power costs relating to pumping. This alternative was abandoned due to concerns that the anticipated geomorphic response (incision) could negatively affect the tailwater control of the fish friendly pump. The incision could create conditions affecting the pump's ability to be compliant with fish screening criteria and the ability of the pump to meet the MDC's water rights.

TAC Alternative 2 - Natural Channel

This alternative consisted of constructing a natural channel over the MDD and siphon using step-pool structures and screening the existing diversion. This alternative was abandoned due to concerns related to the geologic conditions of the stream channel and banks. It was uncertain as to whether or not the step-pool structures would remain in place. The stream banks are highly erodible and the stream bed is likely to incise in the future, making it difficult to ensure the step-pool structures would function as designed.

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

Clover Creek flows southwest out of the mountainous headwater regions in Shasta County to its confluence with Cow Creek and the water then flows further downstream approximately 10.5 miles to the confluence with the Sacramento River. The project area is within the basin region of the creek, which encompasses the area within the watershed where the four principal tributaries of Cow Creek join together and intersect with the main branch of Cow Creek. Elevations within this region range from 450 feet to 1,000 feet above mean sea level. Neither Clover Creek nor Cow Creek are classified as wild and scenic; however the aesthetic quality of the project area and within the Clover Creek sub-watershed overall is high. The area is characterized by a shallow perennial creek surrounded by a farmed and grazed foothill upland landscape. Clover Creek falls is approximately ten miles upstream from the project site, on privately owned land and provides scenic values. The property on which the project site is located includes a 1,976 square-foot domestic residence and several outbuildings.

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) Substantially degrade the existing visual character or quality of the site and its surroundings; 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 MDD and siphon, would remain.

Proposed Action Alternative

Under this alternative, any direct impacts to aesthetics would be considered short-term and minor in intensity. The project site is located on private land with a farming history and is not included in a National Wild and Scenic Rivers System management plan. The MDD and siphon are not in consideration for National Register listing, therefore the proposed project would not visually impact any historic structure characteristics.

The moderately remote nature and topography of the project area helps shield any temporary visual construction impacts from view. The proposed project construction would have a short-term impact on the visual environment. No new light sources would result from the proposed project. The project is not

located within a state scenic highway. The impacts of short-term project implementation would therefore be less than significant.

3.2 Agricultural Resources

3.2.1 Affected Environment

The project site is located in a remote foothill setting in central Shasta County. The Shasta County General Plan designations within the project area are Exclusive Agricultural (EA) District and Agricultural Preserve (AP) District.

Six different soil map units occur within the project site according to the local soil survey [U.S. Department of Agriculture (USDA) – Soil Conservation Service (SCS) et al. 1967]. The soils mapped within the proposed project area include the following map units (Table 2).

Table 2. Land Capability Classifications

Soil	Land Capability Classification	Soil Description
Cobbly alluvial land, frequently flooded	IVs-0	Soils have very severe limitations that restrict the choice of plants or that require very careful management, or both. Soil is limited mainly because it is shallow, droughty or stony.
Honn fine sandy loam, 3 - 8 percent slopes	IIe-1	Soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices. The main hazard is the risk of erosion unless close-growing plant cover is maintained. Soils have a potential or actual wind or water erosion hazard.
Ink-Pentz complex, 30 – 50 percent slopes	VIIs-1	Soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat. Soil is limited mainly because it is shallow, droughty or stony. Soils have a potential or actual wind or water erosion hazard.
Los Robles loam, 0 – 3 percent slopes and Myers silty clay, 0 – 3 percent slopes	IIs-5	Soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices. Soil is limited mainly because it is shallow, droughty or stony. Soils have fine or very fine textures.
Rock land	VIIIs-1	Soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or aesthetic purposes. Soil is limited mainly because it is shallow, droughty or stony.

Agricultural uses in the general area include livestock grazing and production of hay. No Prime Farmland, Unique Farmland and Farmland of Statewide Importance is present within the project site, but is present near the project site (California Department of Conservation 2013b). A portion of the project property is enrolled in the Williamson Act. Water from the existing diversion and siphon are used by MDC members for irrigation and livestock water.

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; or

c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use.

No Action Alternative

Under this alternative, no change from the existing agricultural uses would occur. Diverted flows from Clover Creek would continue to service the MDC members and no changes would occur to the diversion system. There would be no conflict impacts to the agricultural land uses in the project area.

Proposed Project Alternative

Under this alternative, the amount of water that is diverted would not be reduced. Flows would continue to be diverted between spring and late fall / early winter, and provisions for improved passage and protection of fishes would be implemented. The proposed project would have no impact on any surrounding land, agricultural land uses, nor would it convert any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural uses. 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, could result in conversion of Farmland, to non-agricultural use. Because there would be no impacts to agricultural resources, no mitigation is required.

3.3 Air Quality / Greenhouse Gas Emissions

3.3.1 Affected Environment

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. Shasta County is part of the Northern Sacramento Valley Air Basin, and is under the jurisdiction of the Shasta County Air Quality Management District (SCAQMD). Similar to federal requirements, the 1988 California Clean Air Act outlines a program to attain the California Ambient Air Quality Standards. The California Air Resource Board, California's state air quality management agency, regulates mobile source emissions and oversees the activities of the SCAQMD. Within Shasta County, the SCAQMD is responsible for adopting and enforcing controls on stationary sources of air pollutants through its permit and inspection programs.

Other SCAQMD responsibilities include monitoring air quality, regulating agricultural burning, preparation of clean air plans and responding to air quality complaints from citizens.

Shasta County is currently designated as a "Moderate" non-attainment area for state standards for both ozone and particulate matter less than ten microns in diameter (PM_{10}). Shasta County is currently in attainment or unclassified for all federal standards of criteria pollutants.

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. The proposed project is not located within 1,000 feet of a sensitive receptor such as a school, hospital or senior housing. The closest sensitive receptor to the project site is the Millville Elementary School, located approximately 3.7 miles from the closest project boundary.

Climate Change and Greenhouse Gases

Climate change refers to a significant change in measures of climate, such as average temperatures, precipitation, and wind patterns over time. Significant changes in global climate patterns have recently been associated with global warming, an average increase in the temperature of the atmosphere near the earth's surface, attributed to the accumulation of greenhouse gas (GHG) emissions in the atmosphere.

In February 2010, the Council on Environmental Quality (CEQ) prepared NEPA guidance on consideration of the effects of climate change and GHG emissions. The guidance identifies ways in which Federal agencies can improve consideration of GHG emissions and climate change for federal actions. The guidance states that NEPA documents should provide decision-makers with relevant and timely information and should consider 1) GHG emissions of a Proposed Action and alternative actions, and 2) the relationship of climate change effects to a Proposed Action or alternatives. Specifically, if a Proposed Action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of carbon dioxide (CO_2)-equivalent GHG emissions on an annual basis, agencies should consider this as an indicator that a quantitative assessment may be meaningful to decision-makers and the public (CEQ 2010).

As of August 2007, CEQA lead agencies are required by law to analyze the potential of a Proposed Action to produce GHG emissions, which consist primarily of CO_2, nitrous oxide (N_2O), and methane (CH_4) (Public Resources Code Section 21083.05). The Governor's Office of Planning and Research released a Technical Advisory in June 2008 (California Office of Planning and Research 2008) that provides guidance for addressing CEQA GHG environmental impacts. In particular, "Lead agencies should make a good faith effort, based on available information, to calculate, model, or estimate the amount of CO_2 and other GHG emissions associated with vehicular traffic, energy consumption, water usage and construction activities" (California Office of Planning and Research 2008).

3.3.2 Environmental Consequences / Impacts and Mitigation Measures

Data for the impacts analysis were taken from the following reports on local and regional air quality: *Northern Sacramento Valley Planning Area 2012 Triennial Air Quality Attainment Plan, Planning and Permitting Air Quality Handbook* (Sacramento Valley Air Quality Engineering and Enforcement Professionals 2013) and the *Shasta County General Plan* (Shasta County 2004). 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) Violate any air quality standard;
c) Contribute substantially to an existing or projected air quality violation;
d) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard;
e) Result in sources of toxic air contaminants that may affect surrounding land uses;
f) Expose sensitive receptors to substantial pollutant concentrations;
g) Create objectionable odors affecting a substantial number of people;
h) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
i) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHG.

No Action Alternative

Under this alternative, the dam retrofitting activities, siphon replacement, spawning gravel augmentation and all construction related activities would not occur. Because this alternative would not cause any direct short term emissions, emissions would remain consistent with current agricultural and other agriculture in the area. 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

Under this alternative, activities associated with the proposed project would require the retrofitting of the existing MDD with a fish screen and fish ladder, the filling and abandonment of the existing siphon, the construction of a new siphon, construction of a fish ladder at the siphon site and implementing spawning gravel augmentation. The proposed construction and retrofitting would occur over the course of several months during the summer and fall. Equipment and materials for the proposed project would be transported to the site using haul trucks and heavy-duty construction equipment. Types of construction equipment to be used would be excavators, front end loaders, concrete pump trucks, haul trucks, truck crane, dump trucks and truck and trailer combinations.

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 and 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.

The project would involve the use of equipment and travel on unpaved roads to the site, 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 air basin is in "moderate" non-attainment status for the State of California; however, the project would not result in a cumulatively considerable net increase of this criteria pollutant. Construction activities associated with the project are expected to take several months. Once activities cease at the project area, the resulting impact on air quality and increase in GHG emissions would also cease.

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 used during construction would 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. Listed below is the estimated number of vehicle trips and types of equipment that would be used for the project.

Vehicle Trips

- 165 rock haul truck trips (20-ton-loads)
- 6 large flatbed trailer trips (to bring equipment to / from the site)
- 15 large flatbed truck trips (to bring supplies to the site)
- 125 dump truck trips (to bring gravel to the site for temporary crossings)

Equipment

- Large front-end loader
- Large flatbed truck
- Large flatbed trailer
- Large excavators
- Haul trucks
- Dump trucks (eight-yard-capacity)
- Truck cranes
- Concrete pump trucks

While project construction activities and vehicular travel to and from the work site 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 air emissions and increases in GHG. The increase in GHG emissions due to construction, demolition and grading activities would be short-term and would not exceed the 25,000 metric tons of carbon dioxide (CO_2)-equivalent GHG emissions threshold.

GHG emissions and any effects on global climate change would not be cumulatively significant considering the amount of GHG emissions generated by the project and the current local air quality conditions. The proposed project is consistent with the USFWS Climate Change Strategy's goals and objectives, including the promotion of habitat connectivity and integrity (USFWS and U.S. Department of the Interior 2010). The retrofitting of the dam with fish ladders and fish screens and the replacement of the siphon would facilitate the movement of native fish species. As primarily a dam retrofit, siphon replacement, fish ladder and screen installation and spawning gravel augmentation project, the proposed project would not result in land use changes within the project area.

Opportunities for reducing GHG emissions from construction equipment and vehicular travel to and from the work site and associated fuel consumption are addressed in the mitigation below. The proposed project would not conflict with any identified plans adopted for the reduction of GHG emissions. Therefore, relative to GHG emissions, the proposed project would result in less than significant impacts.

The project is not projected to produce toxic air contaminants which could affect surrounding land uses. Also the project would not produce odors that would create a nuisance for any substantial number of people in the immediate area. The project is not located within 1,000 feet of a sensitive receptor and would not expose anyone to substantial pollutant concentrations. The project would also not conflict with or obstruct implementation of the applicable air quality plan.

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

AIR-1: Obtain a Fugitive Dust Permit from the SCAQMD and implement all standard mitigation measures stipulated in the permit.

AIR-2: All construction equipment will be maintained in proper tune according to manufacturer's specifications.

To the extent feasible, the use of diesel construction equipment meeting the CARB 1996 or newer certification standard for off-road heavy-duty diesel engines will be maximized.

If required by the SCAQMD, verify that owners or operators of vehicles are registered with the California Air Resources Board DOORS program: (www.arb.ca.gov/msprog/ordiesel/ordiesel.htm). The DOORS program assists fleet owners in reporting their off-road diesel vehicle inventories to reduce vehicle emissions, as required by the In-Use Off-Road Diesel Regulation.

If required by the SCAQMD, verify that owners or operators of portable engines and certain other types of equipment are registered under the California Air Resources Board's Statewide Portable PERP in order to operate their equipment throughout California without having to obtain individual permits from local air districts: (www.arb.ca.gov/portable/portable.htm).

3.4 Biological Resources

3.4.1 Vegetation and Plant Communities

3.4.1.1 Affected Environment

The predominant vegetation type in the upland portions of the project area is annual grassland. Mixed oak woodland and blue oak woodland / savannah occupy areas of the terraces and lower south-facing slope of the main ridge. Mixed foothill woodland occurs along the upper margins of the ridge top plateau, as well as the north aspect. Mixed riparian woodland / scrub and herbaceous emergent wetland are associated with the corridor of Clover Creek. Small areas of seasonal wetland vegetation are supported by some of the larger seasonal drainages / swales (Figure 10). A list of all plant species encountered during site surveys is included as Appendix B.

<u>Annual Grassland</u>

This predominant plant community is dominated by mostly non-native annual grasses with scattered native and non-native forbs. Depending on the site, it best corresponds to the *Bromus* (*diandrus, hordeaceus*)-*Brachypodium distachyon* semi-natural stand, and the *Lolium perenne* semi-natural stand (Sawyer et al. 2009). Non-native annual grasses observed include soft chess (*Bromus hordeaceus*), foxtail chess (*Bromus madritensis*), ripgut (*Bromus diandrus*), slender wild oat (*Avena barbata*), Italian wild grass (*Festuca perennis*), silver European hairgrass (*Aira caryophyllea*), nitgrass (*Gastridium ventricosum*), rattail fescue (*Festuca myuros)*, medusa-head (*Elymus caput-medusa*), hedgehog dogtail (*Cynosurus echinatus*) and wall barley (*Hordeum murinum* ssp*. leporinum*). Native grasses observed include few-flowered fescue (*Festuca microstachys*) and in a few places in openings and at woodland edges, California melic (*Melica californica*). Frequently observed non-native forbs include rose clover (*Trifolium hirtum*), common bur-clover (*Medicago polymorpha*), grasspink (*Petrorhagia dubia*), narrow-leaved filago (*Filago gallica*), filarees (*Erodium* spp.), yellow starthistle (*Centaurea solstitialis*), winter vetch (*Vicia villosa* ssp. *varia*) and others. Native annual herbs frequently observed include valley popcorn-flower (*Plagiobothrys canescens*), California plantain (*Plantago californica*), q-tips (*Micropus*

californicus), small-headed clover (*Trifolium microcephalum*), foothill clover (*T. ciliatum*), cowbag clover (*T. depauperatum*), bicolored lupine (*Lupinus bicolor*), marigold navarretia (*Navarretia tagetina*), sticky navarretia (*N. viscidula*), downy navarretia (*N. pubescens*), doveweed (*Croton setigerus*), spanish lotus (*Acmispon americanus*), wrangel lotus (*Acmispon wrangelianus*), valley tassels (*Castilleja attenuata*), vinegar-weed (*Trichostemma lanceolatum*), fitch's spikeweed (*Centromadia fitchii*), rosinweed (*Calycadenia truncata*), and others. Frequently-observed native perennial herbs include California brodiaea (*Brodiaea californica*), harvest brodiaea (*B. coronaria*), narrow-leaved soaproot (*Chlorogalum angustifolium*) and round-toothed ookow (*Dichelostemma multiflorum*).

Valley Oak Woodland

A relatively small area of this type, comprised of valley oak (*Quercus lobata*) and scattered blue oak (*Quercus douglasii*), dominates the relatively level deeper-soil alluvial terrace on the northeast portion of the study area. This corresponds best to the Valley Oak Woodland Alliance (Sawyer et al. 2009). The stands are mostly older mature trees with little regeneration apparent; shrubs are mostly lacking. The understory and open areas are dominated by mostly non-native annual grasses and scattered native and non-native forbs already mentioned.

Blue Oak Woodland / Savannah

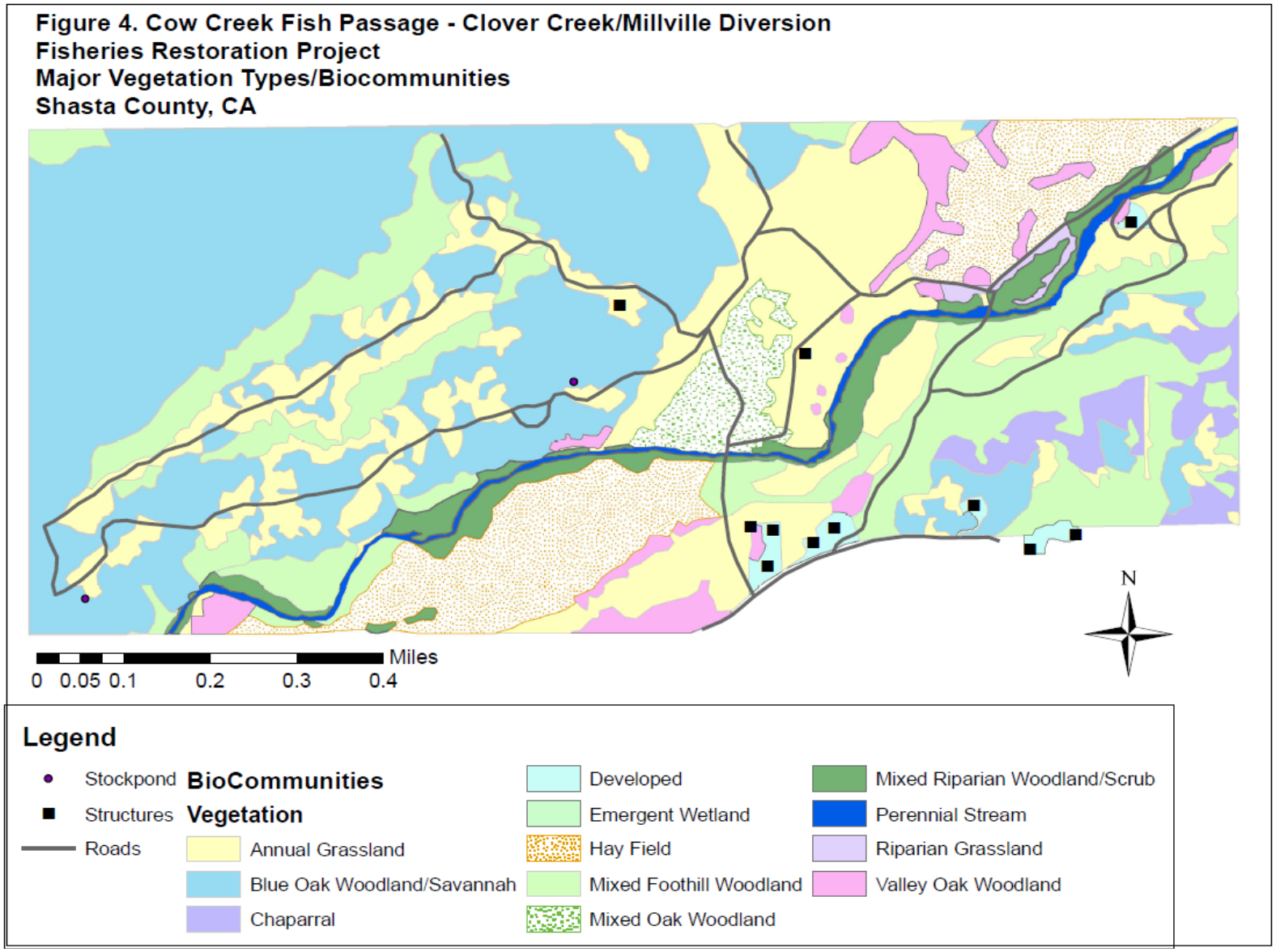
This woodland type dominates thinner, rocky substrates on the south-facing slope, toe slope and alluvial bench on the north side of Clover Creek. This corresponds closest to the *Quercus douglasii* Woodland Alliance (Sawyer et al. 2009). The dominant tree is blue oak, with occasional foothill pine (*Pinus sabiniana*) and interior live oak (*Quercus wislizenii*). Scattered shrubs include sticky manzanita (*Arctostaphylos viscida*), big manzanita (*Arctostaphylos manzanita* ssp*. manzanita*), buckbrush (*Ceanothus cuneatus*) and occasional poison oak (*Toxicodendron diversilobum*). The understory and open areas are dominated by mostly non-native annual grasses and scattered native and non-native forbs.

Mixed Foothill Woodland

This woodland type dominates the upper south-facing slope and north-facing slope of the main ridge on the north side of Clover Creek, as well as the slopes around the ridge on the south side of the creek, south and east of the bridge-crossing near the siphon. This corresponds closest to the *Quercus wislizenii* Woodland Alliance (Sawyer et al. 2009). Species composition varies by site, but is generally comprised of a mostly closed canopy of trees, generally dominated by interior live oak and a varied mix of blue oak, foothill pine and in places black oak (*Quercus kelloggii*). Several trees appearing to be oracle oak (*Q.* x *morehus*) were observed along the upper edge of the woodland on the north-aspect of the main ridge north of Clover Creek. The shrub component varies by site, but generally includes scattered sticky manzanita, big manzanita, buckbrush, poison oak, hoary coffeeberry (*Frangula tomentella* ssp. *tomentella*), and occasional California buckeye (*Aesculus californica*) and California yerba santa (*Eriodictyon californicum*). In places where the tree canopy is densest, the herbaceous understory is depauperate. Elsewhere it is comprised of a varied mix of grasses, usually including non-native hedgehog dogtail, slender wild oat, bromes (*Bromus* spp.) and occasional native California melic, blue wild rye (*Elymus glaucus*) and squirreltail (*Elymus elymoides* ssp. *californicus*). Chaparral honeysuckle

Figure 10. Major Biocommunities and Vegetation Types.

(Source: Dittes and Guardino Consulting 2013)



(*Lonicera interrupta*) is a frequent vine; California grape (*Vitis californica*) was also observed. Native forbs observed include purple sanicle (*Sanicula bipinnatifida*), wavy-leaved soaproot (*Chlorogalum pomeridianum*), mexican onion (*Allium penninsulare* var. *penninsulare*), California goldenrod (*Solidago velutina* ssp. *californica*), climbing bedstraw (*Galium porrigens* var. *tenue*) and occasional narrow-leaved mule's-ears (*Wyethia angustifolia*). Non-native common hedge parsley (*Torrilis arvensis* ssp. *arvensis*) is a frequent component.

Mixed Oak Woodland

This woodland type was mapped as a separate polygon on the north side of Clover Creek, on the alluvial terrace in the central portion of the study area. This woodland is comprised of valley oak with scattered blue oak. The herbaceous component is annual grassland; shrubs are mostly lacking. This corresponds best to the Valley Oak Woodland Alliance (Sawyer et al. 2009).

Mixed Riparian Woodland / Scrub

This woodland type is associated with the banks and, in places, adjacent low terrace along Clover Creek. Composition varies by location. Along the upper banks and immediately adjacent terrace, depending on the site and scale of consideration, this type corresponds imperfectly to the *Populus fremontii* Fremont Cottonwood Forest Alliance and to the *Alnus rhombifolia* Woodland Alliance, and along immediate banks and where larger trees are lacking, to the *Salix exigua* and *S. lasiolepis* Shrubland Alliance (Sawyer et al. 2009). Trees observed include Fremont cottonwood (*Populus fremontii*), Oregon ash (*Fraxinus latifolia*), white alder (*Alnus rhombifolia*), box elder (*Acer negundo*), valley oak, black walnut (*Juglans hindsii*), and black willow (*S. gooddingii*). Shrubs and subshrubs include sandbar willow (*Salix exigua*), arroyo willow (*S. lasiolepis*), shining willow (*S. lasiandra* ssp. *lucida*), red or black willow (*S. laevigata* or *hindsii*), occasional California buckeye, brown dogwood (*Cornus glabrata*), mulefat (*Baccharis salicifolia*), California rose (*Rosa californica*) and California brickllebush (*Brickellia californica*). Several blue elderberry (*Sambucus nigra* ssp. *caerulea*) bushes were encountered. Vines observed include California grape, California pipevine (*Aristolochia californica*) and Virgin's bower (*Clematis ligusticifolia*). Himalayan blackberry (*Rubus armeniacus*) is abundant in places, particularly along the immediate bank. Herbaceous species observed include blue wild rye, Santa Barbara sedge (*Carex barbarae*), rosila (*Helenium puberulum*), mint (*Mentha* sp.), bird's-foot trefoil (*Lotus corniculatus*), western goldenrod (*Euthamia occidentalis*), mugwort (*Artemisia douglasiana*), ryegrass (*Lolium perennis*), bermudagrass (*Cynodon dactylon*), white sweet-clover (*Melilotus albus*) and Kentucky bluegrass (*Poa pratensis*).

Riparian Grassland

A few small areas of this type were mapped along the north side of Clover Creek, mostly on the north and south side of the Millville Ditch. This corresponds to the *Elymus triticoides* Herbland Alliance (Sawyer et al. 2009). Other species include annual ryegrass (*Festuca perennis*), meadow fescue (*Festuca arundinacea / pratensis*), blue wild rye and intermediate wheatgrass (*Elymus hispidus*). Drier areas support some of the grass species mentioned for the annual grassland type.

Emergent Wetland

Small areas of emergent wetland are associated with the margins of Clover Creek. Depending on the site, this vegetation corresponds to the *Eleocharis macrostachya* Herbland Alliance, *Schoenoplectus acutus* Herbland Alliance, and *Carex nudata* Herbland Alliance (Sawyer et al. 2009). In addition to these species, others near water's edge include soft rush (*Juncus effusus*), ditch beardgrass (*Polypogon*

interruptus), tall cyperus (*Cyperus eragrostis*), cocklebur (*Xanthium strumarium*), rice cutgrass (*Leersia oryzoides*) and sticktight (*Bidens frondosa*).

3.4.1.2 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 & Guardino 2013) that was prepared for the proposed project. This document is available on the WSRCD website on the current project's webpage (http://www.westernshastarcd.org/index.html). A preliminary investigation was performed that included a query of the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (CNPS 2013) for Shasta County. The California Natural Diversity Data Base (CNDDB) (CDFW 2013) was also queried for special-status plant species from the United States Geological Survey (USGS) Palo Cedro 7.5' quadrangle, in which the project is located, along with the eight adjoining quadrangles including the Enterprise, Bella Vista, Oak Run, Clough Gulch, Tuscan Buttes NE, Balls Ferry, Cottonwood and Project City quadrangles. In addition, the Consortium of California Herbaria was queried for special-status plant species potentially recorded from the vicinity, but not included in the CNDDB. A previous botanical investigation, conducted within a portion of the overall study area, was also reviewed (Castro 2007). The results of these database queries were used, along with consideration of site location and habitat, to compile a list of vascular plant species with potential to occur in the project area (Appendix C).

Field surveys were conducted by Dittes & Guardino Consulting staff on June 11, 2012, and May 23, 2013. An intuitive-controlled survey was performed within the project site with the aid of a boundary map on aerial photo-base. The rock harvest area which was formerly part of the proposed project was also surveyed for botanical resources. All proposed construction, staging and gravel augmentation areas were completely surveyed where vegetation allowed access on foot. The stream channel, bed and banks were directly / completely inspected. In addition, all access roads were walked and the edges / margins inspected. Particular attention was paid to areas with thinner-rockier soils and seasonal / ephemeral drainages. 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 collected and identified later in the lab. Scientific names follow Baldwin et al. (2012); common names follow Oswald (2002).

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 or USFWS;

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 federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

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 plan.

The thresholds of significance listed above were 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 project site.

Proposed Action Alternative

Under this alternative, no direct or indirect impacts to any special-status plant species would occur. No special-status vascular plant species have been previously documented from the site as indicated by the database queries. None were encountered during the 2012 and 2013 field surveys and the likelihood of their occurrence and chance they may have been missed is low (Dittes and Guardino Consulting 2013). Timing of the 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. No plant species were encountered that were not identifiable to the level necessary to make a determination of significance.

Impacts to riparian vegetation near the MDD, the siphon, the gravel augmentation site and the roadways to access the project may occur due to temporary impacts from project construction. Implementation of the proposed project may result in potential impacts to areas of riparian willow / scrub wetland, mixed riparian woodland / scrub communities. This is considered a potentially significant impact. These sensitive habitat areas are potentially jurisdictional and under regulation of the U.S. Army Corps of Engineers (USACE) under authority of Section 404 of the Clean Water Act, and of CDFW under Section 1600 of the Fish and Game Code. Revegetation would occur for all areas impacted. All restoration planting shall be maintained to replace vegetative cover and provide long-term erosion protection.

Invasive exotic plant species could potentially be introduced to the project area by the importation of plant seeds and tissues during the mobilization of equipment and could be spread by movement of equipment from one location to another within the project area. 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 measures would be implemented to avoid and minimize impacts to vegetation and plant communities and to mitigate potentially significant impacts to vegetation and plant communities to less than significant levels:

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

VEGETATION-2: All heavy equipment shall be thoroughly cleaned prior to mobilization onsite to remove any soil, weed seeds and plant parts in order to reduce the importation and spread of invasive non-native plant species.

VEGETATION-3: Only certified weed-free straw shall be used for erosion control or other purposes to reduce the importation and spread of invasive non-native plant species.

VEGETATION-4: A revegetation plan will be prepared to replace impacted riparian wetlands and riparian habitat by a measure of quantity and quality equal to, or exceeding impacts of the project or as required by regulatory permit conditions, using appropriate native riparian trees and shrubs.

VEGETATION-5: Areas with woody vegetation that have been disturbed will be revegetated in accordance with the revegetation plan.

VEGETATION-6: Whenever feasible, existing trees within the alignment shall be left in place. All trees to be removed shall be clearly marked on the project plan sheets.

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

3.4.2 Wildlife

3.4.2.1 Affected Environment

Six habitat types generally occur within the proposed project site as defined by the California Wildlife-Habitat Relationships (WHR) classification system (Mayer & Laudenslayer 1988). The habitat types include: Riverine, Fresh Emergent Wetland, Valley Foothill Riparian, Valley Oak Woodland, Blue Oak – Foothill Pine, Annual Grassland and Cropland. 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 (foothills of the Sacramento Valley). A list of all wildlife species observed during site surveys is included as Appendix D.

3.4.2.2 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 and consultation with resource agency staff. The assessment of potential impacts of the proposed project on wildlife is also based on a Biological Assessment (BA), available on the WSRCD website on the webpage (http://www.westernshastarcd.org/index.html) and WHR list (Bratcher 2015, Appendix E) from CDFW that was prepared for the proposed project and a records search of the CNDDB (CDFW 2015) conducted to determine if any special-status wildlife species had previously been documented within the project site, or in the vicinity of the project site. The query was conducted using the USGS Palo Cedro 7.5' quadrangle, in which the project is located, along with the eight adjoining quadrangles including Enterprise, Bella Vista, Oak Run, Clough Gulch, Tuscan Buttes NE, Balls Ferry, Cottonwood and Project City. In addition, a species list was generated using the USFWS Sacramento Fish and Wildlife Office website (USFWS 2015) for the Palo Cedro quadrangle.

Based on the results of the CNDDB and USFWS database searches, and TES's staff knowledge of the site and local area, a list of potentially occurring special-status wildlife species was developed for the proposed project, as well as an evaluation of their potential presence (Appendix F). For the purposes of this evaluation, special-status species were defined as:

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

Field surveys (and additional observations made during work conducted at the project site for other purposes) were conducted from 2007 to 2013 by Tehama Environmental Solutions Inc. (TES) staff. The study area included the entire project footprint, as well as an approximately 200-foot surrounding buffer area and included the rock harvest area which was formerly part of the project area. The surveys were conducted by walking the entire study area and recording direct wildlife observations. Observations were made using the unaided eye, binoculars and identification of vocalizations. Other methods included vocal solicitations and observations of animal tracks, scat and bird feathers. No species specific protocol-level wildlife surveys were conducted. Additional surveys for Valley Elderberry Longhorn Beetle (VELB) *(Desmocerus californicus dimorphus)* habitat and exit holes were conducted in 2012 by CDFW.

The list of species evaluated in this document were derived as a result of further evaluations of the list of potentially-occurring species found in Appendix F.

Based on further evaluation, the following special-status wildlife species, or groups of species, are known to, likely to, or may occur within the project area, and could potentially be impacted by the proposed project:

- Western Pond Turtle *(Emys marmorata)*
- Foothill Yellow-legged Frog (*Rana boylii*)
- Western Spadefoot *(Spea hammondii)*
- Tricolored Blackbird (*Agelaius tricolor*)
- Grasshopper Sparrow *(Ammodramus savannarum)*
- Golden Eagle *(Aquila chrysaetos)*
- Short-eared Owl *(Asio flammeus)*
- Long-eared Owl *(Asio otus)*
- Burrowing Owl (*Athene cunicularia hypugea*)
- Vaux's Swift *(Chaetura vauxi)*
- Northern Harrier (*Circus cyaneus*)
- Olive-sided Flycatcher *(Contopus cooperi)*
- Little Willow Flycatcher *(Empidonax traillii brewsteri)*
- White-tailed Kite (*Elanus caeruleus*)
- American Peregrine Falcon (*Falco peregrinus anatum*)
- American Bald Eagle *(Haliaeetus leucocephalus)*
- Yellow-breasted Chat *(Icteria virens)*
- Loggerhead Shrike *(Lanius ludovicianus)*
- Purple Martin (*Progne subis*)
- Bank Swallow *(Riparia riparia)*
- Yellow Warbler *(Setophaga petechia)*
- Other Nesting Raptors
- Other Nesting Migratory Birds
- Valley Elderberry Longhorn Beetle *(Desmocerus californicus dimorphus)* and its Critical Habitat
- Pallid Bat *(Antrozous pallidus)*
- Ringtail (*Bassariscus astutus*)

- Townsend's Big-eared Bat *(Corynorhinus townsendii)*
- Spotted Bat *(Euderma maculatum)*
- Western Mastiff Bat *(Eumops perotis)*
- Western Red Bat (*Lasiurus blossevillii*)

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). Adult turtles were observed during site surveys. The aquatic habitats within Clover Creek provide favorable habitat for this species.

Foothill Yellow-legged Frog

The foothill yellow-legged frog is designated as 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 (Zeineret al. 1988). Breeding occurs following the end of spring flooding from mid-March to May (Zeineret al. 1988). Adults forage on aquatic and terrestrial invertebrates and are rarely found far from permanent water (Zeineret al. 1988). Foothill yellow-legged frogs were not observed during site surveys; however potential habitat is present within the aquatic habitats of the project site. This species is known to occur approximately 0.75 miles downstream of the site in the Clover Creek watershed (T. Bratcher pers. comm. 2015), there is a moderate likelihood of foothill yellow-legged frog occurring within the project site.

Western Spadefoot

The western spadefoot is designated as a CDFW Species of Special Concern. Population declines are attributed to habitat conversion, introduction of non-native predators including fish, bullfrogs and crayfish, road construction, environmental pollution and exposure to activities that produce low frequency noise and vibration (USFWS 2004). This species primarily inhabits grassland habitats but can occasionally occur in valley-foothill hardwood woodlands (Zeiner et al. 1988). Adults spend most of the year in underground burrows and initiate surface movements to breed in response to early fall rains. They require temporary rain pools that persist for a minimum of three weeks in order for the larvae to metamorphose successfully (Jennings and Hayes 1994). Breeding and egg-laying typically occur from late-winter to the end of March (Zeiner et al. 1988). They forage on a variety of insects, worms and other invertebrates (USFWS 2004). Western spadefoot were not detected during site surveys; however, potential breeding habitat is present within the study area. Several small inundated wetland areas

within the ephemeral drainage corridor provide marginal potential breeding habitat for the western spadefoot. It is not likely that the western spadefoot would be impacted by this project if they are present, as all project work would be conducted during the summer and fall months which occur outside of the breeding season for this species.

Tricolored Blackbird

The tricolored blackbird was listed as Endangered by the State of California in 2014 under an emergency regulatory action with an effective date of December 29, 2014 through June 30, 2015. Reported potential threats to the species include water diversion, land conversion and heavy predation by mammals, corvids and black-crowned night herons (Riparian Habitat Joint Venture 2004). This species constructs nests of mud and plant material in dense cattails or tules and thickets of willow, blackberry, wild rose and herbs (Zeiner et al. 1990). Nesting is highly colonial and usually located in wetlands or in dense vegetation near open water (Riparian Habitat Joint Venture 2004). Nesting areas must generally be large enough to support approximately 50 pairs (Zeiner et al. 1990a). Tricolored blackbirds forage on seeds and insects in croplands, grasslands, flooded areas and edges of ponds (Zeiner et al. 1990a). It is not likely that the tricolored blackbird would nest within the project site, due to a lack of suitable nesting habitat of sufficient size. Tricolored blackbird were not observed during site surveys; however they may forage within the project site if nesting habitat is present in the general area.

Grasshopper Sparrow

The grasshopper sparrow is a CDFW Species of Special Concern. Reported potential threats to the species include urbanization, expansion of vineyards and fire suppression, if it leads to grassland converting into unsuitable habitats such as dense scrub (Shuford and Gardali 2008). The grasshopper sparrow is more likely to be found in large tracts of habitat than in small ones. Minimum area requirements are approximately 100 hectares (247 acres) in Maine and 30 hectares (74 acres) in Illinois. In general, grasshopper sparrows in California prefer short to middle-height, moderately open grasslands with scattered shrubs (Shuford and Gardali 2008). The breeding season for this species extends from mid-March to August. This species builds nests domed with grasses and forbs with a side entrance, in a slight depression in the ground, hidden at the base of an overhanging clump of grasses or forbs, with the rim approximately level to the ground (Shuford and Gardali 2008). The grasshopper sparrow diet is roughly 63 percent animal matter (mainly grasshoppers) and 37 percent vegetable (plants / seeds), and they forage primarily on the ground (bare ground is critical microhabitat for effective foraging) or from low vegetation (Shuford and Gardali 2008). Grasshopper sparrows were not observed during site surveys; however, potential nesting and foraging habitat is present within the grassland habitats of the project site. Grasshopper sparrows are known to nest within the general area near Millville Plains and Parkville Road.

Golden Eagle

The golden eagle 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. This species has declined near human population centers (Remsen 1978). The loss and alteration of grasslands, shooting, and human disturbance at nest sites are reported to have contributed to the decline of the species (Remsen 1978). The golden eagle is a permanent resident throughout California, except in the center of the Central Valley, although it winters in this area (Zeiner et al. 1990a). Golden eagles typically inhabit rolling foothills, mountainous areas, sage-juniper flats, and deserts (Zeiner et al. 1990a). It breeds from late-January through August, peaking from March through July, and nests on cliffs and in large trees near

open areas. Golden eagles often maintain alternative nest sites and old nests are often reused (Zeiner et al. 1990a). The golden eagle needs open areas for hunting and their diet consists mostly of lagomorphs and rodents, but also includes other mammals, reptiles, birds, and some carrion (Zeiner et al. 1990a). It is not likely that the golden eagle would nest within the project site, due to a lack of suitable nesting habitat and the presence of an active bald eagle nest within the project site. Golden eagles may forage within the project site, potential winter foraging habitat is present within the project site. They were not observed during site surveys.

Short-eared Owl

The short-eared owl is designated as a Species of Special Concern by CDFW. Reported threats to short-eared owls include shooting, habitat loss and degradation, grazing, invasive exotic weeds, water management, and disease (Shuford and Gardali 2008). A year-round resident in certain areas within California, this species breeds most regularly in northeastern California and in the Suisun Marsh (Shuford and Gardali 2008). Geographic range or abundance is difficult to describe due to breeding range fluctuations which follow prey availability and abundance cycles (Shuford and Gardali 2008). Nesting short-eared owls require open country such as saltwater and freshwater marshes, irrigated alfalfa or grain fields and ungrazed grasslands and old pastures which support rodents such as voles, lemming and muskrats. The breeding season stretches from March through July. This species requires herbaceous cover sufficient to conceal their ground nests from predators (Shuford and Gardali 2008). Short-eared owls mainly feed on small mammals. Short-eared owls are not likely to nest within the project site due to the fact that the project site is well outside the current known range of nesting for the species; however, potential winter foraging habitat is present within the project site. Short-eared owls were not observed during site surveys.

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, along with 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 were not observed during site surveys; however, there is potential long-eared owl nesting and foraging habitat present within the project site.

Burrowing Owl

The burrowing owl is a CDFW Species of Special Concern. Population declines are attributed to conversion of grassland to agriculture, other habitat destruction, and poisoning of ground squirrels (Remsen 1978). Collisions with automobiles may also be a significant cause of mortality. Burrowing owls are yearlong residents of open, dry grassland, desert habitats, and open shrub stages of pinyon-juniper and ponderosa pine habitats. This species eats mostly insects, small mammals, reptiles, birds, and carrion. They use ground squirrel burrows or other burrows for roosting and nesting cover, or they may dig their own burrow in soft soil. Burrowing owls were not observed during site surveys; however marginal nesting and foraging habitat is present within the grassland habitats of the project site.

Vaux's Swift

The Vaux's swift is designated as a DFG Species of Special Concern. Threats to this species are not well-documented but losses of suitable nesting trees due to timber harvest may be a concern. This species nests inside large hollow trees in redwood, Douglas fir and other conifer habitats (Zeiner et al. 1990a). Breeding occurs from early May to mid-August and often occurs in large colonies (Zeiner et al. 1990a). They feed exclusively on flying insects and forage widely during long-distance high-elevation flights over varying terrain, but prefer to forage over rivers and lakes. There is no suitable Vaux's swift nesting habitat present within the project site. This species was not observed during site surveys; however, they may forage within the project site, particularly during spring and fall migration periods.

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). This species was not observed during site surveys; however, potential nesting and foraging habitat is present within the grassland and agriculture fields within the project site.

Olive-sided Flycatcher

The olive-sided flycatcher is designated as a DFG Species of Special Concern. Threats to the species include habitat degradation in both summer range and winter range. Olive-sided flycatchers are a neotropical migrant species that build cup nests primarily in montane conifer forests where tall trees overlook canyons, meadows, lakes or other open terrain. In the Sierra Nevada, they utilize open mixed conifer forests and are generally considered an edge species (Altman and Sallabanks 2000). Nesting occurs from early May to late August in large, tall trees, in mixed conifer, montane hardwood-conifer, Douglas-fir, redwood, red fir, and lodgepole pine (Grinnell and Miller 1944). Roost sites typically are in dead tips or uppermost branches of the tallest trees in the vicinity, for singing posts and hunting perches (Zeiner et al. 1990a). They forage for flying insects over forest canopy or adjacent meadows, clearings, or shrub-covered slopes. Olive-sided flycatchers are not likely to nest within the project site, due to the low elevations of the site. This species was not observed during site surveys; however, they may forage within the project site during spring and fall migration.

Little Willow Flycatcher

The little willow flycatcher, a subspecies of willow flycatcher, was listed by the State of California as Endangered in 1991. The little willow flycatcher was once a common breeder in Central Valley riparian habitats but nesting appears now to be restricted to upper elevations. Reported potential threats to the species include riparian habitat loss, livestock grazing and nest parasitism by brown-headed cowbirds (*Molothrus ater*) (CDFG 2005). They nest in dense willow thickets in upper elevations near rivers, streams and lakes (Zeiner et al. 1990a). Little willow flycatchers are not likely to nest at the project site due to low elevations. This species was not observed during site surveys; however, they may forage within the project site during spring and fall migration.

White-tailed Kite

The white-tailed kite is designated as Fully Protected by CDFW. 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 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). This species was not observed during site surveys; however, potential nesting and foraging habitat is present throughout the project site.

American Peregrine Falcon

The American peregrine falcon is designated as a Fully Protected species under the California Fish and Game (CDFG) Code. The species was previously listed as Endangered by the State of California and was delisted in 2009. The species was originally listed as Endangered by USFWS and was delisted in 1999. Declines in population associated with this species are attributed primarily to dichlorodiphenyltrichloroethane (DDT) contamination (Zeiner et al. 1990a). Riparian areas and coastal and inland wetlands are important habitats yearlong, especially in non-breeding seasons. They require protected cliffs and ledges for cover. They breed near wetlands, lakes, rivers or other waters, and nest on cliff ledges, human structures and occasionally, in cavities in large snags and old nests from other raptors. The American peregrine falcon feeds primarily on birds including ducks, and also takes mammals and fish. Potential nesting habitat is present within the vicinity of the project site along the utility transmissions lines. American peregrine falcon were not observed during site surveys; however, they may forage within the project site.

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 CDFG 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 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 (CDFG 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 (CDFG 2005). An American bald eagle nesting territory is located within the immediate vicinity of the project. In some years, a nest within the project area is used. In 2015, it appeared that the pair used an alternative nesting site located approximately 0.70 miles downstream of the low water crossing below the siphon (T. Bratcher pers. comm.). Recent observations indicate that the nest within the project site is no longer present (T. Bratcher pers. comm.).

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). This species was observed during site surveys. Potential nesting and foraging habitat is present within the project site. Yellow breasted chat are likely to nest within the project area.

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). No loggerhead shrikes were observed during site surveys; however, potential nesting and foraging habitat is present in riparian and upland habitats within the study area.

Purple Martin

The purple martin is designated as a DFG Species of Special Concern. Declines in purple martin populations have been attributed to the loss of nesting habitat due to competition for nest cavities with the introduced European starling *(Sturnus vulgaris)* and house sparrow *(Passer domesticus),* and the removal of snags and riparian habitat (Remsen 1978, Zeiner et al. 1990a). Purple martin are a neotropical migrant species that nest in cavities in tall, large trees, bridges, utility poles, lava tubes and buildings, with low canopy cover near the nest height (greater than 20 percent within 100 meters) (Shuford and Gardali 2008). Nesting occurs from April into August in valley foothill and montane hardwood, hardwood-conifer, and riparian habitats as well as closed-cone pine-cypress, ponderosa pine, Douglas fir and redwood habitats (Zeiner et al. 1990a). They feed primarily on large insects, such as dragonflies, primarily hawking them in flight, but occasionally forage on the ground in riparian areas, forests and woodlands. Purple martin are not likely to nest within the project site, due to the project site being located outside of the current known range of nesting for the species. This species was not observed during site surveys; however, they may forage within the project site during spring and fall migration.

Bank Swallow

The bank swallow was listed as Threatened by the State of California in 1989. Bank swallow declines have been attributed to the elimination of nesting habitat due to channelization of rivers and flood control projects, particularly rip-rapping of natural stream banks (CDFG 2005). Recovery efforts are focused on preserving habitat and restoring naturally meandering riverine ecosystems (CDFG 2005). The bank swallow is a neotropical migrant species that winters in South America. They are a colonial nesting species that burrows into fine-textured vertical stream banks to construct their nests from early May through July (Zeiner et al. 1990a). Most of California's remaining populations nest along the upper Sacramento River in areas where natural stream meander still occurs. They forage by hawking insects during flight, feeding primarily over water and riparian areas. Bank swallows are not likely to nest within the project site due to a lack of suitable nesting habitat. It is not likely that the bank swallow would nest within the project site, due to a lack of suitable nesting habitat. This species was not observed during site surveys; however, they may forage within the project area if nesting habitat is present in the general area.

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 riparian habitats within the study area. No yellow warblers were observed during site surveys; however, they may forage within the project site during spring and fall migration if nesting does not occur locally.

Other Nesting Raptors

Nesting habitat exists within, and near the project site for several raptor species (eagles, hawks, and owls) protected under several sections of the CDFG Code. Several raptor species were observed during site surveys (Appendix D). A number of additional raptor species, while not observed, may potentially nest within, or near the project site. Several large and medium-sized nests were observed within, or in the vicinity of the study 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 by CDFW as special-status species, but are protected under the federal Migratory Bird Treaty Act. A number of migratory bird species were observed during site surveys (Appendix D). A number of additional migratory bird species, while not observed, may potentially nest within, or near the project site.

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. 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 presumed historical range of VELB represents a patchy distribution from Tehama County to Fresno County (USFWS 2014). Observations of adult beetles have been reported from Shasta County in 2008 and 2009 in CNDDB records, from exit hole observations in 1991 and 2007 through 2012 (Holyoak and Graves 2010, as cited in USFWS 2014) and an unconfirmed adult male VELB observation in 2013 (Souza 2014, pers. comm., as cited in USFWS 2014). USFWS did not include Shasta County within the presumed historical range because of the difficulty in distinguishing female VELB from female California elderberry longhorn beetle, the unconfirmed observation of an adult male valley elderberry longhorn beetle and the absence of museum specimens from this area. However, USFWS (USFWS 2014) acknowledged that the recent observations of exit holes in portions of Shasta County (along the Sacramento River) may

represent an expansion of the historic range of the VELB to Shasta County. No exit holes were observed during site surveys; however, potential habitat is present within the project site. The CDFW surveys mapped a total of 56 elderberry shrubs within the project area and up to a 200-foot perimeter. Many of the shrubs were in poor condition due to grazing-related impacts and several are located in the immediate footprint of the construction area. The remaining 40 plants are located within 100 feet of the construction footprint. There were no elderberry plants located within the vicinity of the lower water crossing. The project is not located within or near the currently designated CH.

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. 1990a). 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 feed on large arthropods including scorpions, cicadas, katydids, beetles, crickets, grasshoppers, praying mantids and moths (Bolster et al. 1998). Potential roosting and foraging habitat is present within the project site. This species was not detected during site surveys; however, focused bat surveys were not conducted.

Ringtail

The ringtail is designated as a Fully Protected species under the CDFG 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. This species was not observed during site surveys; however, potential denning, nesting and foraging habitat is present within the project site.

Townsend's Big-eared Bat

The Townsend's big-eared bat was listed as a Candidate for listing as Endangered or Threatened by the State of California on December 11, 2013. The main threat to this species is roost loss 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 and mine tunnels, 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 (CDFW 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 feed primarily on large moths but also take small numbers of other insects (Bolster et al. 1998). No roosting habitat is present within the project site; however, they may forage within the project area if roosting habitat is present in the general area. This species was not detected during site surveys; however, focused bat surveys were not conducted.

Spotted Bat

The spotted bat is a CDFW Species of Special Concern. This species is considered one of the rarest mammals in North America but the reasons for population declines are not well documented (Zeiner et al. 1990b). The spotted bat is a solitary species and forages late at night, principally for moths. They roost in rock crevices, cliffs, caves and buildings with cliffs providing optimal habitat. Females favor ponderosa pine habitats during the reproductive season (Williams 1986). Occupied habitats range from arid deserts and grasslands to mixed conifer forests (Zeiner et al. 1990b). No roosting habitat is present in the project area; however, spotted bats may forage within the project site if roosting habitat is present in the general area. This species was not detected during site surveys; however, focused bat surveys were not conducted.

Western Mastiff Bat

The western mastiff bat is a CDFW Species of Special Concern. Reasons for decline of this species are attributed to extensive loss of habitat, cultivation of foraging habitat, and use of insecticides (Williams 1986). The species is non-migratory and day-roosts alone or in small colonies in crevices in rock outcrops, cliffs, trees and buildings. They occupy semi-arid to arid habitats including conifer and deciduous woodlands, coastal scrub, grasslands, and chaparral (Zeiner et al. 1990b). Night roosts are seldom used due to their prolonged foraging period. They feed primarily on hymenopteran insects (Zeiner et al. 1990b). When roosting in rock crevices, western mastiff bats need vertical faces to drop off from to take flight. No roosting habitat is present in the project area; however, western mastiff bats may forage within the project site if roosting habitat is present in the general area. This species was not detected during site surveys; however, focused bat surveys were not conducted.

Western Red Bat

The western red bat is designated as a CDFW Species of Special Concern. Potential threats to this species include a variety of animals that prey on red bats, including owls, hawks, opossums, cats, and jays. Their roosting habitat includes forests and woodlands, ranging from sea level to mixed conifer forests. They roost near edge habitats adjacent to streams, fields, or urban areas in trees (Zeiner et. al. 1990a). 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. Potential roosting and foraging habitat is present within the project site. This species was not detected during site surveys; however, focused bat surveys were not conducted.

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 local wildlife populations as a result of current farming, ranching and diversion maintenance activities would continue to occur.

Proposed Action Alternative

Western Pond Turtle

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

Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels.

Foothill Yellow-legged Frog

Under this alternative, foothill yellow-legged frogs could be harmed or killed if they were present within the project area during project construction activities. This is considered a potentially significant impact. Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels.

Beneficial impacts may result from the implementation of the gravel augmentation, which would provide foothill yellow-legged frogs with improved passage upstream and downstream of the project site, instream habitat conditions for egg-laying and increased aquatic invertebrate populations for foraging.

Western Spadefoot

Under this alternative, it is not likely that the western spadefoot would be impacted by this project if they were present during construction activities, as all project work would be conducted during the summer and fall months which occur outside of the breeding season of January through May for this species. No potentially significant impacts are anticipated.

Tricolored Blackbird

Under this alternative, while this species is not likely to nest within or near the project site, project activities could cause disturbance to foraging activities if tricolored blackbirds were present in the project vicinity. Potential activities that could cause disturbance to foraging activities include people and equipment working at the project site and noise from project construction activities. This is not considered a potentially significant impact as impacts to foraging activities would not generally be considered significant, due to the temporary nature of the project construction activities.

Grasshopper Sparrow

Under this alternative, project activities could cause nests to be destroyed or abandoned if active grasshopper sparrow nests were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause nest destruction or abandonment include people and equipment working at the project site, vegetation removal and noise from construction activities. This is considered a potentially significant impact. Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels.

Golden Eagle

Under this alternative, project activities could cause disturbance to foraging activities if golden eagles were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause disturbance to foraging activities include people and equipment working at the project site, vegetation removal and noise from construction activities. This is not considered a potentially significant impact as impacts to foraging activities would not generally be considered significant, due to the temporary nature of the project construction activities.

Short-eared Owl

Under this alternative, project activities could cause disturbance to foraging activities if short-eared owls were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause disturbance to foraging activities include people and equipment working at the project site, vegetation removal and noise from construction activities. This is not considered a potentially significant impact, as impacts to foraging activities would not generally be considered significant, due to the temporary nature of the project construction activities. It is not likely that the short-eared owl will be impacted by this project if they are present during winter foraging, as all project work will be conducted during the fall months which occur outside of the breeding season for this species.

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 and were disturbed by project construction activities. Potential activities that could cause nest destruction or abandonment include people and equipment working at the project site, vegetation removal and noise from construction activities. This is considered a potentially significant impact. Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels.

Burrowing Owl

Under this alternative, project activities could cause nest or burrow abandonment if burrowing owl nests were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause nest or burrow abandonment include people and equipment working at the project site, vegetation removal and noise from project construction activities. This is considered a potentially significant impact. Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels.

Vaux's Swift

Under this alternative, project activities could cause disturbance to foraging activities if Vaux's swifts were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause disturbance to foraging activities include people and equipment working at the project site, vegetation removal and noise from project construction activities. This is not considered a potentially significant impact as impacts to foraging activities would not generally be considered significant, due to the temporary nature of the project construction activities.

Northern Harrier

Under this alternative, project activities could cause nest abandonment if active northern harrier nests were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause nest abandonment include people and equipment working at the project site, vegetation removal and noise from project construction activities. This is considered a potentially significant impact. Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels.

Olive-sided Flycatcher

Under this alternative, project activities could cause disturbance to foraging activities if olive-sided flycatchers were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause disturbance to foraging activities include people and equipment working at the project site, vegetation removal and noise from project construction activities. This is not considered a potentially significant impact as impacts to foraging activities would not generally be considered significant, due to the temporary nature of the project construction activities.

Little Willow Flycatcher

Under this alternative, project activities could cause disturbance to foraging activities if little willow flycatchers were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause disturbance to foraging activities include people and equipment working at the project site and noise from project construction activities. This is not considered a potentially significant impact as impacts to foraging activities would not generally be considered significant, due to the temporary nature of the project construction activities.

White-tailed Kite

Under this alternative, project activities could cause nest abandonment if active white-tailed kite nests were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause nest abandonment include people and equipment working at the project site, vegetation removal and noise from project construction activities. This is considered a potentially significant impact. Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels.

American Peregrine Falcon

Under this alternative, project activities could cause nest abandonment if active American peregrine falcon nests were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause nest abandonment include people and equipment working at the project site, vegetation removal and noise from project construction activities. This is considered a potentially significant impact. Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels.

American Bald Eagle

Under this alternative, project activities could cause nest abandonment if active American bald eagle nests were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause nest abandonment include people and equipment working at the project site, vegetation removal and noise from project construction activities. This is considered a potentially significant impact. Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels.

Beneficial effects to bald eagle could occur as a result of the proposed project, from the increased potential for prey abundance, as a result of improved salmonid populations.

Yellow-breasted Chat

Under this alternative, project activities could cause nest abandonment if active yellow-breasted chat nests were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause nest abandonment include people and equipment working at the project site, vegetation removal and noise from project construction activities. This is considered a potentially significant impact. Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels.

Loggerhead Shrike

Under this alternative, project activities could cause nest abandonment if active loggerhead shrike nests were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause nest abandonment include people and equipment working at the project site, vegetation removal and noise from project construction activities. This is considered a potentially significant impact. Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels.

Purple Martin

Under this alternative, project activities could cause disturbance to foraging activities if purple martins were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause disturbance to foraging activities include people and equipment working at the project site, vegetation removal and noise from project construction activities. This is not considered a potentially significant impact as impacts to foraging activities would not generally be considered significant, due to the temporary nature of the project construction activities.

Bank Swallow

Under this alternative, project activities could cause disturbance to foraging activities if bank swallows were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause disturbance to foraging activities include people and equipment working at the project site, vegetation removal and noise from project construction activities. This is not considered a potentially significant impact as impacts to foraging activities would not generally be considered significant, due to the temporary nature of the project construction activities.

Yellow Warbler

Under this alternative, project activities could cause nest abandonment if active yellow warbler nests were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause nest abandonment include people and equipment working at the project site, vegetation removal and noise from project construction activities. This is considered a potentially significant impact. Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels.

Other Nesting Raptors

Under this alternative, project activities could cause nest abandonment if other active nesting raptor nests were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause nest abandonment include people and equipment working at the project site, vegetation removal and noise from project construction activities. This is considered a

potentially significant impact. Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels.

Other Nesting Migratory Birds

Under this alternative, project activities could cause nest abandonment if other active nesting migratory bird nests were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause nest abandonment include people and equipment working at the project site, vegetation removal and noise from project construction activities. This is considered a potentially significant impact. Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels.

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 (blue elderberry bushes) 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. Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels.

Pallid Bat

Under this alternative, project activities could cause pallid bats to abandon their roost or awaken from winter hibernation if bats were using any roosting habitat near the project site for maternity activities or as a winter roost. Disturbance to maternity roosts, can cause bats to abandon their young, causing mortality. Bats that are awakened from winter hibernation tend to expend excess energy, which can cause a significant decrease in fat reserves, which can eventually lead to a decrease in condition, and potential mortality. Potential activities that could cause roost abandonment or awakening from winter hibernation include people and equipment working at the project site, roost removal and noise from project construction activities. This is considered a potentially significant impact. Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels.

Ringtail

Under this alternative, ringtail could be harmed or killed if active ringtail dens or nests were present within the project site and were disturbed by project construction activities. Potential activities that could cause harm involve equipment physically disturbing active dens or nests. This is considered a potentially significant impact. Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels.

Townsend's Big-eared Bat

Under this alternative, project activities could cause disturbance to foraging activities if Townsend's big-eared bats were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause disturbance to foraging activities include people and

equipment working at the project site and noise from project construction activities. This is not considered a potentially significant impact as impacts to foraging activities would not generally be considered significant, due to the temporary nature of the project construction activities.

Spotted Bat

Under this alternative, project activities could cause disturbance to foraging activities if spotted bats were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause disturbance to foraging activities include people and equipment working at the project site and noise from project construction activities. This is not considered a potentially significant impact as impacts to foraging activities would not generally be considered significant, due to the temporary nature of the project construction activities.

Western Mastiff Bat

Under this alternative, project activities could cause disturbance to foraging activities if western mastiff bats were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause disturbance to foraging activities include people and equipment working at the project site and noise from project construction activities. This is not considered a potentially significant impact as impacts to foraging activities would not generally be considered significant, due to the temporary nature of the project construction activities.

Western Red Bat

Under this alternative, project activities could cause disturbance to foraging activities if western red bats were present within or near the project area and were disturbed by project construction activities. Potential activities that could cause disturbance to foraging activities include people and equipment working at the project site and noise from project construction activities. This is not considered a potentially significant impact as impacts to foraging activities would not generally be considered significant, due to the temporary nature of the project construction activities.

Critical Habitat

The project area is not located within the designated CH for VELB, therefore there would be no impacts to VELB CH.

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

WILDLIFE-1: Prior to work in aquatic habitats, water bodies shall be surveyed by a qualified biologist to determine if any foothill yellow-legged frogs or western pond turtles are present. If any individuals of these species are found, a qualified and permitted biologist shall determine and implement appropriate relocation procedures. Herpetological exclusion fencing shall be erected around the perimeter of the instream work areas prior to construction initiation. Exclusionary fencing shall be maintained daily and remain until work in aquatic habitats is complete.

WILDLIFE-2: A qualified biologist experienced in the identification of amphibian species (particularly *Rana* species) will conduct survey(s) for California red-legged frogs at a frequency / rate deemed acceptable by

the CDFW to determine if this species is present within any of the disturbance areas. If any California red-legged frogs are found to be present, all potentially disturbing construction activities will be suspended until appropriate protective measures can be developed in consultation with the USFWS ESA staff.

WILDLIFE-3: Prior to the initiation of construction, a survey to identify active bald eagle nests within 0.50 mile (as access allows) of project construction, shall be conducted by a qualified biologist. If active bald eagle nests are found to be present, tree removal, vegetation clearing and the onset of potentially disturbing construction activities shall be suspended until the qualified biologist, in consultation with CDFW and USFWS, makes a determination as to whether construction work will affect the active nest or disrupt reproductive behavior and whether appropriate protective buffer areas or monitoring will be required to minimize impacts to nesting bald eagles. No construction activities should commence within established buffer areas until the qualified biologist determines that the nest is not active or the juvenile birds have fledged and are no longer using the nest as their primary day and / or night roost.

Trees with unoccupied eagle nests shall not be removed.

WILDLIFE-4: Any tree removal, vegetation clearing, or the onset of potentially disturbing construction activities shall occur between August 31 and January 1 (outside of the nesting season for avian species).

If tree removal, vegetation clearing, or the onset of potentially disturbing construction activities must occur during the nesting season for non-raptor avian species (March 1 through July 31), a nesting survey of the construction area and adjacent suitable habitat shall be conducted by a qualified biologist no more than seven days prior to the initiation of the onset of these activities. If active avian 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 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.

If tree removal, vegetation clearing, or the onset of potentially disturbing construction activities must occur during the raptor nesting season January 1 through August 31, a raptor nesting survey of the construction area and a 0.25 mile buffer (as access allows) shall be conducted by a qualified biologist no more than seven days prior to the initiation of the onset of these activities. 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 should commence within the buffer area until the qualified biologist determines that the young birds have fledged or the nest is no longer active.

WILDLIFE-5: Prior to any construction work, a survey shall be conducted by a qualified biologist to ensure that pallid bats are not roosting within the areas to be disturbed.

If pallid bats are found to be roosting within the area to be disturbed, construction activities shall be suspended until a qualified biologist, in consultation with CDFW, can establish appropriate measures to minimize impacts to pallid bats.

WILDLIFE-6: Prior to construction, a qualified biologist will inspect the area to be disturbed to determine if potential ringtail denning is occurring.

If potential ringtail denning is found to be occurring, construction activities should be suspended until a qualified biologist, in consultation with CDFW, can establish appropriate measures to minimize impacts to ringtail.

WILDLIFE-7: 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 should 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-8: 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 potentially significantly impacted by the project in the environmental documents.

WILDLIFE-9: Aquatic habitat preservation: Embedded pieces of large woody debris or the stumps of existing trees that can potentially serve as basking sites and/or encourage pool formation shall be left in place whenever possible. If removal is determined to be necessary (none anticipated), large woody debris, large flat boulders, or stumps will be replaced with structures of equal or greater habitat value.

WILDLIFE-10: To reduce potential impacts to VELB to less than significant levels, the proposed project shall comply with 1999 USFWS *Conservation Guidelines for the Valley Elderberry Longhorn Beetle*, or as directed by the results of the ESA Section 7 consultation with the USFWS.

Prior to construction, biological surveys for potential habitat, not identified in previous VELB surveys shall be completed.
All elderberry shrubs within 100 ft. of the Project Area boundary will be clearly flagged, and the flags will be maintained throughout the duration of the Project's construction. If access to the shrub is difficult due to dense riparian growth, then the boundary of the riparian stand will be clearly flagged, whichever is more protective of the elderberry shrub.
All elderberry shrubs that are within 50 ft. of Project activity will be clearly fenced; the purpose of the fencing and fencing specs (e.g. color of fencing) shall be clearly shared with construction employees and staff.

If elderberry shrubs cannot be avoided then the mitigation guidelines in the USFWS 1999 *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* will be followed or mitigation credits will be purchased from a USFWS-approved mitigation bank.

Any revegetation efforts will consider and incorporate use of elderberries in the planting mix, where appropriate.

WILDLIFE-11: As close to the beginning of construction as possible, but not more than 14 days prior to construction, a qualified biologist shall conduct a final pre-activity survey of the construction zone to ensure that no other special-status wildlife species have recently occupied the site, including at a minimum those species described as potentially occurring, and species listed in the California Wildlife Habitat Relationship Program list generated for this project by CDFW. If special status species nests or roosting sites are found, a services-approved biologist shall be employed to determine and implement appropriate relocation procedures or exclusion zones, in coordination with regulatory agencies. If special-status species are found during the pre-construction survey, the biologist will be present immediately prior to construction activities that have the potential to impact special-status species to identify and protect potentially sensitive resources. In addition, special status wildlife species captured during fish removal activities (see FISH-3) will be carefully located either above the dam / upper water crossing OR below the low water crossing so that potential impacts to these species are minimized.

WILDLIFE-12: 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 and could include such measures as physical removal from equipment, freezing equipment and saturation of equipment in a chemical solution(s).

With incorporation of these mitigation measures (Appendix G), no significant impacts to state or federally-listed animal species (with the exception of special-status animal species are expected to occur

as a result of the proposed project. A “may affect, not likely to adversely affect” determination is anticipated for VELB. This would be addressed as part of the consultation with USFWS under Section 7 of the Endangered Species Act. With incorporation of the mitigation measures listed above, the project is not expected to jeopardize the continued existence of any listed species.

WILDLIFE-13: Exclusionary devices approved by CDFW and / or USFWS, shall be installed on the bridge near the siphon by February 15 to exclude swallows from nest building. The exclusion measures shall be monitored and maintained at a frequency sufficient to ensure that nest building is not occurring and to ensure there are no open entry points.

If exclusionary devices fail to exclude swallow nesting, all traces of nesting precursors (mud placed by swallows for construction of nests) shall be continuously removed, including new and old nesting materials. Any nest shall be removed at the first sign of nest building and before the nest reaches a size which could hold any eggs. Nest removal shall not result in the destruction of any eggs or completed nests or cause harm to adult swallows or any other birds.

If a swallow nest with eggs and / or young birds are found, work must stop until a no-disturbance buffer is established and marked in the field in coordination with CDFW. All exclusionary devices shall be removed after project completion.

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

3.4.3.1 Affected Environment

Wetlands and other potentially jurisdictional waters of the U.S. (other waters) are present within the project area, associated with Clover Creek, ephemeral and intermittent drainages and human-made features associated with the diversion system that carries the water diverted by the MDD.

Error! Not a valid bookmark self-reference.. presents the acreage of wetlands and other waters identified within the project area, followed by a description of the wetlands and other waters that are present.

Wetlands

Riparian Wetland

The riparian wetland features are associated with the banks and in places, the adjacent low terrace along Clover Creek. These features are dominated by Fremont cottonwood, Oregon ash and white alder. Other woody species include Box elder, valley oak, black walnut, and black willow, sandbar willow, arroyo willow, shining willow, red willow, California buckeye, brown dogwood, mulefat, California rose, California brickllebush and blue elderberry. Vines observed include California grape, California pipevine and virgin’s bower. Himalayan blackberry is abundant in places, particularly along the immediate bank. Herbaceous species observed include blue wild rye, Santa Barbara sedge, rosila, mint, bird’s-foot trefoil, western goldenrod, mugwort, ryegrass, bermudagrass, white sweet-clover and Kentucky bluegrass.

Table 3. Summary of Preliminary Delineated Waters of the U.S.

DELINEATED AREA TABLE

FEATURE	AREA (acres)
WETLANDS	
Wet Meadow	0.01
Riparian Wetland (Multiple Polygons)	0.73
TOTAL WETLANDS	0.74
OTHER WATERS	
Ephemeral Stream	0.16
Intermittent Stream	0.06
Perennial Stream	0.84
Ditch	0.11
TOTAL OTHER WATERS	1.16
TOTAL WATERS OF THE U.S.	1.91

(Source: TES 2013)

Wet Meadow

Wet Meadows are the result of an access road being constructed in an ephemeral drainage which caused water to pond on the upstream side of the road and a small gravel borrow pit. These features are ephemeral in nature and are dominated by swamp timothy (*Crypsis schoenoides),* rye grass (*Festuca perennis),* pale spike rush (*Eleocharis macrostachya)* and coyote thistle (*Eryngium castrense*). Both of these shallow features appear to dry up very early after the wet season concludes.

Other Waters of the U.S.

Ephemeral Stream

Several ephemeral streams are associated with some of the smaller seasonal drainages that drain southward towards Clover Creek from the main ridge. Another area of this type is located on the alluvial terrace near the barn, on the south side of Clover Creek in the northeastern-most portion of the study area. These potentially jurisdictional areas do not correspond well with any of the Alliances of Sawyer et al (2009). Annual ryegrass and Mediterranean Barley are prominent.

Intermittent Stream

Several intermittent streams are associated with some of the larger drainages that drain Clover Creek.

Perennial Stream

A perennial stream is present within the channel of Clover Creek. The creek channel is primarily devoid of vegetation, but the exposed barren rock and gravel along both banks of the stream support scattered woody and herbaceous species such as willows *(Salix spp.)*, white alder, torrent sedge, hardstem bulrush, spike sedge, soft rush, ditch beardgrass, tall cyperus, cocklebur, rice cutgrass and sticktight.

Ditch

The ditch system represents potentially jurisdictional waters of the U.S. due to the fact that it carries water from and / or to a jurisdictional feature (Clover Creek). The ditches are regularly maintained but do support emergent and woody vegetation along the banks in some areas.

3.4.3.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

A delineation of waters of the U.S. was conducted for the project site on September 4, 2012 and September 5, 2012, by TES staff including Mr. Jeff Souza, Senior Biologist and Mr. Ben Myhre, Associate Biologist (TES 2013). Mr. Myhre returned to the site on June 28, 2013 to collect data for the proposed spawning gravel augmentation location. The delineation also included the former harvest area. This document is available on the WSRCD website on the webpage (http://www.westernshastarcd.org/index.html). 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)* (USACE 2008) using a Routine Determination Method. Based on the results of the delineation, maps of all identified wetlands and other waters were prepared. 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 MDD structures would remain in their current state and the fish ladders, fish screen and gravel augmentation would not be implemented.

Proposed Action Alternative

Under this alternative, as a result of the modifications to the MDD, siphon and spawning gravel augmentation, some of the structures, and some of the wetland and other waters of the U.S. features would be temporarily or permanently impacted as represented below in Table 4. This is considered a potentially significant impact. Beneficial impacts to Clover Creek would occur as a result of the spawning gravel augmentation by creating / enhancing riffle and pool complexes, which are considered special aquatic sites under the Clean Water Act 404 (b)(1) guidelines.

Table 4. Summary of Impacts to Preliminary Delineated Waters of the U.S. Clover Creek / Millville Diversion Fisheries Restoration Project					
Site	**Impacts (acres)**	**Wetlands**		**Other Waters**	**Totals**
Project Totals	**Type**	**Riparian Wetland**	**Perennial Stream**	**Ditch**	
	Temporary	**0.28**	**0.42**	**0.01**	**0.71**
	Permanent	**0.07**	**0.21**	**0.0001**	**0.28**
Project Totals		**0.34**	**0.63**	**0.01**	**0.99**

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 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 or other aquatic habitats 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 Water Board for the project and all permit / certification conditions and all agreements will be adhered to.

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

3.4.4 Fisheries

3.4.4.1 Affected Environment

Clover Creek is an important sub-watershed within the Cow Creek watershed in the Sacramento River system, as it provides spawning habitat for the California Central Valley Steelhead (*Oncorhynchus mykiss*) which are federally-listed as Threatened and Central Valley fall- and late fall-run Chinook salmon (*Oncorhynchus tshawytscha*) (herein referred to as fall- / late fall-run salmon or salmon), which are a state listed Species of Special Concern and a NMFS Species of Concern. The Cow Creek watershed is the first significant eastside tributary to the Sacramento River below the Keswick and Shasta Dams.

The 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 Cow Creek in the *AFRP Final Restoration Plan* (USFWS 2001). 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) and the goals and mission of the CALFED Bay-Delta Program's ERP plan. The foundation of this program is restoration of ecological processes that are associated with streamflow, stream channels watersheds, and floodplains. Two of the main recovery actions in the USFWS 2014 *Recovery Plan for Central Valley July 2014 Chinook Salmon and Steelhead* are development and implementation of actions to reduce or eliminate passage impediments in Cow Creek and development and implementation of spawning gravel augmentation plans in Cow Creek. Cow Creek is now managed for fall-run and late fall-run Chinook salmon and steelhead. These species are all listed as CALFED "Priority Group I Species", whose management "will require substantial manipulations of the ecosystem" and for which CALFED "takes major responsibility for recovery...(CALFED 2000)".

The proposed project is located within the valley reach of Clover Creek, at approximately River Mile 3.5 upstream of the confluence with Cow Creek. Water flows and temperatures vary significantly based on the amount and timing of fall, winter and spring rainfall, as well as irrigation / diversion timing.

The total length of Clover Creek is approximately 27.5 miles. However, historically, prior to construction of the MDD, only 13.5 miles of Clover Creek were accessible to anadromous fish below the approximately 150-foot-high Clover Creek falls, a natural barrier. This lower 3.5 miles is currently the only accessible anadromous fish habitat on Clover Creek.

The Cow Creek watershed provides habitat for several resident and anadromous species of fish and has consistent runs of fall-run Chinook and occasionally late fall-run Chinook salmon and steelhead. Some of the resident fish known to occur in the Cow Creek watershed include: rainbow trout *(Onchorynchus mykiss)*, hardhead *(Mylopharodon conocephalus*), California roach *(Hesperoleucus symmetricus)*, riffle sculpin *(Cottus gulosus)*, speckled dace *(Thinichthys osculus)*, tule perch (*Hysterocarpus traski*), Sacramento pikeminnow (*Ptychocheilus grandis*) and Sacramento sucker (*Catostomus occidentalis*) [SHN Engineers and Geologists (SHN) and Vestra 2001]. River lamprey (*Lampetra ayresii*) may also be present in the Cow Creek watershed. Exotic species known to occur in Cow Creek are brown trout (*Salmo trutta*), brook trout (*Salvelinus fontinalis*), bluegill (*Lepomis macrochirus*), carp (*Cyprinus carpio*), white catfish (*Ameiurus catus*), small-mouth bass (*Micropterus dolomieu*), large-mouth bass (*Micropterus salmoides*), and green sunfish (*Lepomis cyanellus*).

Water Temperature

Water temperature has been found to be a potentially limiting factor in the lower Cow Creek watershed area. Chinook salmon and steelhead adults and juveniles have access to Cow Creek; however, the lower reaches of the tributaries within the Cow Creek Watershed may have an unsuitable temperature range during the months of May through October. Water quality and quantity have important implications for the health of Cow Creek Basin anadromous fish populations. A Shasta College study observed that water temperature in the mainstem of Cow Creek exceeded preferred thresholds for salmon from May to October (Hannaford and North State Institute for Sustainable Communities 2000). The reaches above 2,600 feet have lower summer temperatures; however, access to the higher reaches is limited to most salmon and steelhead adults and juveniles by a steep gradient change and geologic features.

Water quality studies in the Cow Creek watershed have not been adequate to accurately characterize water quality conditions throughout the watershed and differences between tributaries. Baseline data is also insufficient to evaluate long-term trends in watershed conditions that may result from future

management practice changes and rehabilitation activities. Much of the available water quality data are for discrete locations and, in general, are greater than 20 years old and poorly documented.

Figure 11 through Figure 13 indicate the daily maximum, minimum and average water temperatures in Celcius (°C) for reaches of Clover Creek from June 2004 to November 2005. Site 303 sensors were not recovered for June – October 2005 data, as it was possibly removed by a beaver. The 20 °C or 68 °Fahrenheit (°F) line indicates the threshold used in this study for cold water beneficial use by salmonids. Based on the results of this study, daily water temperatures had a range of up to 10 °C in a few of the downstream reaches and upstream tributaries of the Cow Creek watershed. Seasonal variations in water temperatures differed by up to 30 °C in the some areas, including the mid / lower reach of Clover Creek, while only by 10 °C in some areas. Only the higher elevation sites, generally above 2,000 feet in elevation, maintained cold water habitat year-round and lower elevation sites had suitable temperatures for the fall spawning period in mid-October. In general, cold water habitat persisted in the main stem of Cow Creek until approximately the first week of June.

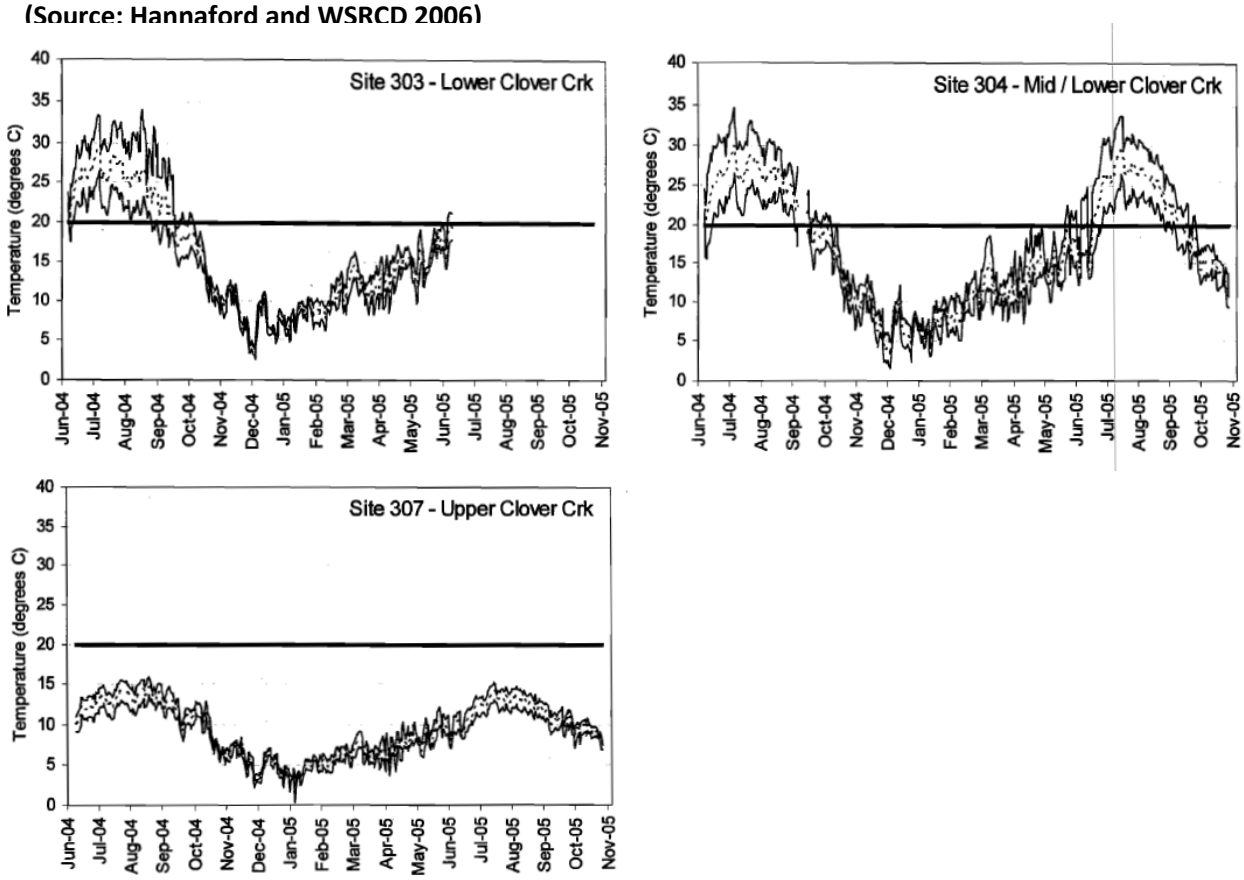
Steelhead surveys in 2002 and 2003 in the Cow Creek watershed (Moore 2003) revealed that water temperatures in main stem Cow and Lower Clover Creeks reached stressful levels (for rainbow trout / steelhead fry and adults) during late-May and lethal levels during late-June of both 2002 and 2003. Hannaford and the WSRCD (2006) also found that water temperatures in Lower Clover Creek reached above 20 °C (threshold used in the study for cold water beneficial use by fish) from the months of June to mid-October of 2004 (Figure 11 through Figure 13).

In the upper Sacramento River watersheds, research has shown that stressful and lethal temperatures observed in the lower reaches of a location such as Clover Creek may not affect adult steelhead migrating upstream or emigrating steelhead smolts because all of the migration activities occur between October and early-spring when water temperatures are relatively cool. Steelhead fry / smolt migration will likely be restricted to a period ending in mid-May due to increasing water temperatures.

There is currently only limited fisheries data for Clover Creek and the following is largely about potential for steelhead use in the Cow Creek watershed, of which Clover Creek is a tributary. Steelhead begin migration into Cow Creek during the late-fall and winter, primarily when flows increase from storms. USFWS identified Cow Creek as important steelhead habitat, and between 1980 and 2000, USFWS and CDFW planted over 870,000 steelhead and juvenile salmon in the Cow Creek watershed (Bratcher 2015). CDFW estimated that Cow Creek once supported annual spawning runs of 500 steelhead (SHN and Vestra 2001). Adult steelhead have been observed in Cow, Old Cow and Little Cow Creeks (CALFED 2000). From 2012 to 2014, steelhead were recorded at the video fish weir station on the main stem of Cow Creek, approximately ten miles downstream of the project area. Personal interviews noted in the *Cow Creek Watershed Assessment* state there were previously salmon and, potentially, steelhead in Clover Creek up to Clover Creek Falls (SHN and Vestra 2001).

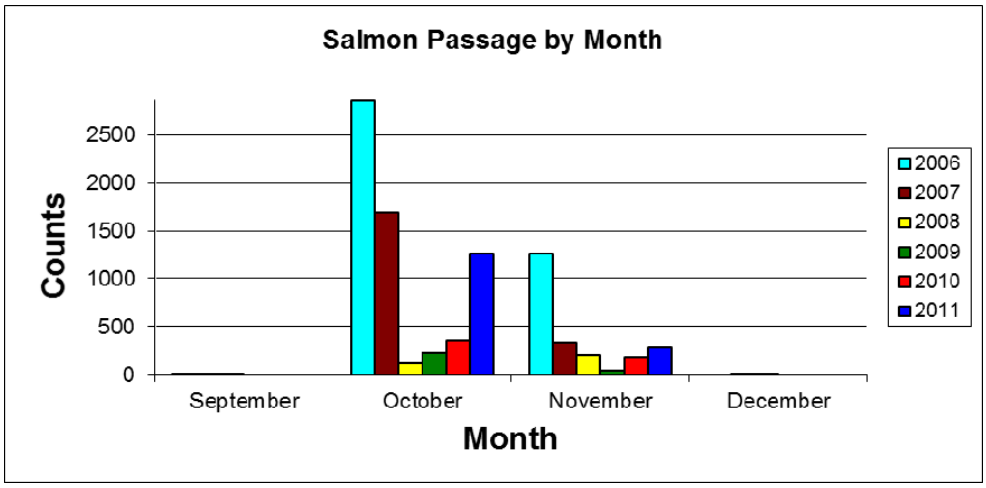
Figure 14. below depicts a summary of fall-run Chinook passage by month that passed the Cow Creek video fish weir station on the main stem of Cow Creek between 2006 and 2011.

Figure 11 - Figure 13. Clover Creek Water Temperatures
(Source: Hannaford and WSRCD 2006)



*Note: n/a indicates that data was not available to depict.

Figure 14. Fall-run Chinook Passage from 2006 to 2011 by Month
(Source: Killam and Merrick 2012)



Estimates of Chinook entering the Cow Creek system have been made intermittently since 1953 as depicted below in Tables 5. through Table 6. Additionally, CDFW recorded estimates of 1,488 salmon in 2012, and 3,011 salmon in 2013. The only available complete habitat survey estimated the spawning area to be sufficiently large enough to support over 15,000 salmon in the Cow Creek watershed (Bratcher 2015). The AFRP, a program under the CVPIA and administered by the USFWS, identified a target population of 4,600 Chinook salmon as a result of addressing limiting factors within the AFRP Final Restoration Plan (USFWS 2001).

Table 5. Summary of fall-run Chinook Escapement into Cow Creek from 1953 to 2011

(Source: Killam and Merrick 2012)

YEAR	Estimate	YEAR	Estimate
1953	3,000	1983	n/a
1954	4,500	1984	250
1955	1,300	1985	n/a
1956	3,200	1986	n/a
1957	700	1987	n/a
1958	3,300	1988	n/a
1959	680	1989	n/a
1960	650	1990	n/a
1961	n/a	1991	n/a
1962	1,500	1992	n/a
1963	n/a	1993	n/a
1964	1,000	1994	n/a
1965	1,000	1995	n/a
1966	7,600	1996	n/a
1967	520	1997	n/a
1968	7,540	1998	n/a
1969	n/a	1999	n/a
1970	n/a	2000	n/a
1971	n/a	2001	n/a
1972	n/a	2002	n/a
1973	n/a	2003	n/a
1974	n/a	2004	n/a
1975	n/a	2005	n/a
1976	726	2006	4,209
1977	n/a	2007	2,044
1978	n/a	2008	478
1979	n/a	2009	265
1980	n/a	2010	536
1981	n/a	2011	1,617
1982	n/a		
AVERAGE all years (1953-2011)			2,119
source Grandtab-CDFG			

Table 6. Temperature and Flow Data in Clover Creek

(Source: CDFW 2011)

Date	Time	CFS	Water Temp	Air Temp	Notes
5/13/2008	800	24.00	61.0	N/A	
5/20/2008	800	24.00	74.0	N/A	
10/14/2008	1645	1.80	62.0	N/A	
10/21/2008	1645	2.00	58.0	N/A	
10/30/2008	1600	2.00	53.0	N/A	
11/3/2008	1320	48.00	53.0	51.0	
11/14/2008	1520	14.35	56.0	N/A	
12/5/2008	835	10.90	42.0	36.0	
12/12/2008	836	14.20	38.0	35.0	
1/8/2009	1504	42.90	44.0	55.0	
1/14/2009	1610	41.40	44.0	56.0	
1/23/2009	1515	49.50	47.0	61.0	
2/11/2009	1515	94.00	47.0	49.0	
2/18/2009	1711	254.00	48.0	52.0	
3/27/2009	840	53.90	53.0	60.0	
4/21/2009	1450	31.10	70.0	94.0	Diversion in
5/9/2009	1600	69.42	63.5	83.0	
5/22/2009	1600	24.10	74.0	93.0	
6/19/2009	910	10.36	72.0	N/A	
10/5/2009	1315	2.49	57.0	N/A	
10/15/2009	835	15.42	59.0	60.0	
5/6/2010	805	48.48	50.5	52.0	
1/20/2011	830	70.57	52.0	N/A	
6/13/2011	815	110.04	52.0	68.0	

Hydrologic Conditions

A hydrograph was created using the historical USGS data and also flow data collected by CDFW and DWR between 2006 and 2011 (Figure 15) both at the MDD and at the historic USGS gage station (#11374000). Based upon these hydrographs, in a typical year, roughly 20 cfs is found in lower Clover Creek at the end of October (when fish have been observed at the MDD) and flows in the 40 cfs range occur in May (during fry migration and the onset of irrigation). It can be assumed that if adults are able to move upstream at an approximate 20 cfs flow, flows of at least that magnitude should be able to provide outmigration flow for fry, given that water temperature is suitable.

Historical Flow Data

A USGS stream gage (#11372700) existed on Clover Creek from May 17, 1957 to September 30, 1959. An existing USGS stream gage (#11374000) has been collecting flow data since 1949 in Cow Creek,

below all tributary influences. Because of the limited amount of data for Clover Creek, an estimated hydrograph was developed for Clover Creek using flow data from the Cow Creek stream gage.

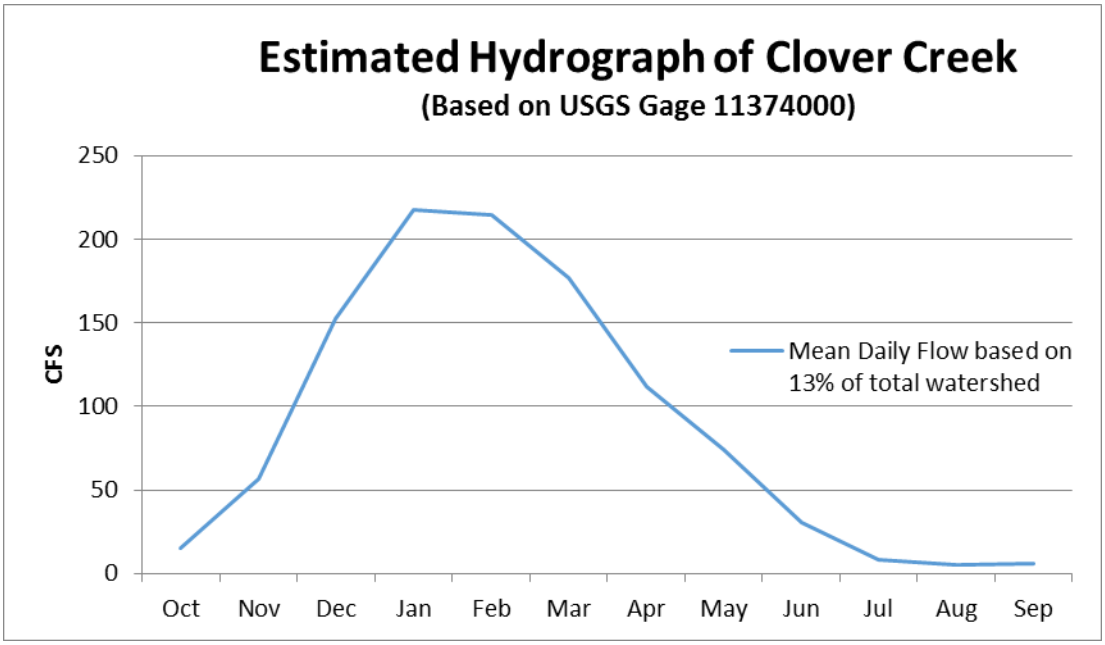
Estimated Hydrograph

According to the Cow Creek Watershed Assessment report (SHN and Vestra 2001), Clover Creek watershed encompasses 13 percent of the entire Cow Creek Watershed. From the report, average precipitation maps of the Cow Creek Watershed were analyzed. The annual precipitation zones were equally distributed over the entire watershed, indicating uniform rainfall distribution. The entire flow in Cow Creek is measured below all tributary influences including Clover Creek. Based on this information, the average daily flow in Clover Creek was estimated by multiplying the average daily flow in Cow Creek by 13 percent.

In order to determine the estimated flows in Clover Creek, the approved mean daily flow from October 1, 1949 through September 30, 2011 was downloaded from the USGS website (gaging station #11374000 in Cow Creek). The mean daily flow in Clover Creek was estimated by taking 13 percent of the mean daily flow in Cow Creek. An estimated hydrograph of Clover Creek was developed (Figure 15).

Figure 15. Estimated Hydrograph of Clover Creek

(Source: Bratcher 2015)



The actual flow data measured in Clover Creek by CDFW was analyzed to see what percent of flow was actually measured based on the total flow in Cow Creek. Based on 24 days over a range of 4 years, the average percent of flow was 13 percent, the median was 14 percent with a standard deviation of 4.6. This analysis was used to verify that the method used to estimate flow in Clover Creek was appropriate.

California Central Valley Steelhead Critical Habitat

The stream reach in which the project is located is within the designated CH for California Central Valley Steelhead. CH for steelhead is defined as specific areas that contain Primary Constituent Elements (PCE) 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 rearing habitat and freshwater migration corridors.

Essential Fish Habitat

The proposed project is within the Essential Fish Habitat (EFH) of Pacific Salmon. EFH occurs within the project area for fall- and late fall-run salmon. EFH has not been designated for steelhead.

3.4.4.2 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 documented in a BA (Bratcher 2015) prepared for the proposed project. The BA is available on the WSRCD website on the webpage (http://www.westernshastarcd.org/index.html). CDFW also prepared a Potential Special Status Wildlife Species list based on the results of conducting a California Wildlife Habitat Relationships (WHR) Database Version 9 program search (Appendix E). Prior to the initiation of field studies, a records search of the CNDDB (CDFW 2015) was conducted to determine if any special-status fish, or rare natural communities had previously been documented within the project site, or in the vicinity of the project site. The query was conducted using the USGS Palo Cedro 7.5-minute quadrangle, in which the project is located, as well as the eight adjoining quadrangles Enterprise, Bella Vista, Oak Run, Clough Gulch, Tuscan Buttes NE, Balls Ferry, Cottonwood and Project City. In addition, a species list was generated using the USFWS Sacramento Fish and Wildlife Office website (USFWS 2015) for the Palo Cedro quadrangle, in which the project is located.

Based on the results of the CNDDB and USFWS database searches, and TES's staff knowledge of the site and local area, a list of potentially occurring special-status fish species was developed for the proposed project, as well as an evaluation of their potential presence (Appendix F). For the purposes of this evaluation, special-status species were defined as:

1. Those species listed by the USFWS or NMFS as Endangered, Threatened, Proposed as Endangered or Threatened, Candidate to become Proposed, or Species of Concern.
2. Those species listed by the 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 from 2007 to 2013 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 D.

The list of species evaluated in this document were derived as a result of further evaluations of the list of potentially-occurring species found in Appendix F.

Based on that further evaluation, the following special-status fish, are known to, likely to, or may occur within the project area, and could potentially be impacted by the proposed project:

- River Lamprey (*Lampetra ayresii*)
- Hardhead (*Mylopharadon conocephalus*)
- California Central Valley Steelhead (*Oncorhynchus mykiss*)
- Central Valley Fall- / Late Fall-run Chinook Salmon (*Oncorhynchus tshawytscha*)

- California Central Valley Steelhead CH
- Pacific Salmon EFH

River Lamprey

The river lamprey is designated as a CDFW Species of Special Concern. It is reported that the populations are likely decreasing due to the decline of suitable spawning and rearing habitat in the lower reaches of larger rivers (Moyle 2002). This species has become uncommon in California, recorded only in the lower Sacramento, San Joaquin and Russian Rivers. The biology of river lampreys has not been well studied in California so information is based on studies in British Columbia where the timing of events in the life history may not be the same as in California. In the three-to-five year ammocoete (juvenile) stage, river lamprey require sandy backwaters or stream edges in which to bury themselves, where water quality is continuously high and temperatures do not exceed 25° Celsius. In the final stages of metamorphosis, river lamprey out-migrate through freshwater, congregate immediately upstream from salt water and enter the ocean in late spring (Moyle 2002). Adults spend three to four months in saltwater, where they grow rapidly and then migrate back into freshwater in the fall to spawn in tributaries from February to May. Adults dig saucer-shaped depressions in gravelly riffles and die after spawning. In the ammocoete stage, river lampreys feed on algae and microorganisms and in the adult stage prey on a variety of fishes.

River lamprey is not well studied in Clover or Cow Creek, and current survey methods are insufficient for determining their presence. This species may be present within the project area in the ammocoete (juvenile) stage and may spawn within the project area. No river lamprey were 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. 1995). 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. 1995).

In the Sacramento River system, they are widely distributed in most of the larger tributaries as well as the river. Hardhead are known to occur within the Cow Creek watershed (SHN and Vestra 2001). Potential spawning and rearing habitat present within the project site. No hardhead were observed during TES field surveys; however, this species is likely to occur within the project area.

Fall-run and 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. Fall-run 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. Late fall-run 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.

Fall-run and late fall-run Chinook spawn in Cow Creek on the valley floor and in all five tributaries (Bratcher 2015). Adults are known to spawn below the MDD, and enter the Cow Creek watershed in some years as early as September, but primarily in October, depending on flow and temperature conditions. Fall- / late fall run salmon were observed in October of 2011 unsuccessfully trying to make it over both the Dam and the siphon structure (Bratcher 2015). Fall-run Chinook spawning in this reach occurs primarily in late-October and early-November, past the time period when project implementation would occur (Bratcher 2015); however, based upon the hydrology and water temperature presented in Section 3.4.4.2 data, Clover Creek could be accessible for upstream adult fall and late fall-run salmon migration and juvenile emigration (from any spawning occurring below the dam) in mid- to late-October through the project area, if suitable flow and water temperatures exist. There is a relatively low frequency of observations of salmon migrating upstream through the main stem of Cow Creek to Clover Creek by mid-October and the water temperatures that normally occur in Clover Creek by mid-October are unsuitable for anadromous fish. Clover Creek has cooler temperatures than the mainstem of Cow Creek at certain times; however, fish must navigate the lower watershed through the mainstem of Cow Creek, to access Clover Creek. There were no observations of fall- / late fall-run salmon during TES field surveys. Based on the lack of observations of salmon in Clover Creek in mid-October, inadequate water temperature within the project areas and downstream in the main stem of Cow in normal years during the time construction would take place, it is unlikely that salmon will be present during construction; however, it is possible that salmon would be present.

Steelhead

The Central Valley (CV) 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 only occur in the Sacramento River and its tributaries. Steelhead stocks in the Central Valley are considered winter-run steelhead (McEwan and Jackson 1996). 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.

Based upon the hydrology and water temperature presented in Section 3.4.4.2 data, Clover Creek could be accessible for upstream adult steelhead migration and juvenile steelhead emigration in mid- to late-October through the project area, if suitable flow and water temperatures exist. There is a relatively low frequency of observations of steelhead migrating upstream through the main stem of Cow Creek to Clover Creek by mid-October and the water temperatures that normally occur in Clover Creek by mid-October are unsuitable for anadromous fish. Clover Creek has cooler temperatures than the main stem of Cow Creek at certain times; however, fish must navigate the lower watershed through the main stem of Cow Creek, to access Clover Creek. Multiple studies in adjacent watersheds (Clear Creek, Battle Creek and Mill Creek) confirm the potential for the presence of steelhead during the construction period of the project (Olson 2010, Harvey 1995, CDFW 2014). Based on the lack of observations of steelhead in Clover Creek in mid-October, inadequate water temperature within the project areas and downstream in the main stem of Cow Creek in normal years during the time construction would take place, it is unlikely that steelhead will be present during construction; however, it is possible that steelhead could be present.

California Central Valley Steelhead Critical Habitat

CH for the CV steelhead Evolutionarily Significant Unit (ESU) was designated by NMFS on September 2, 2005 (70 FR 52488). The project area is within CH for CV steelhead. CH for CV steelhead is defined as specific areas that contain primary constituent elements (PCE) and physical habitat elements essential to the conservation of the species. Following are the inland habitat types used as PCEs for CV steelhead:

Spawning Habitat

Freshwater spawning sites are those with water quantity and quality conditions and substrate supporting spawning, incubation, and larval development. Spawning habitat has a high conservation value as its function directly affects the spawning success and reproductive potential of listed salmonids.

Freshwater Rearing Habitat

Freshwater rearing sites are those with water quantity and floodplain connectivity that form and maintain physical habitat conditions and support juvenile growth and mobility; provide water quality and forage supporting juvenile development; and have natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks. Both spawning areas and migratory corridors comprise rearing habitat for juveniles, which feed and grow before and during their outmigration. Non-natal, intermittent tributaries also may be used for juvenile rearing. Rearing habitat condition is strongly affected by habitat complexity, food supply, and presence of predators of juvenile salmonids. Freshwater rearing habitat also has a high conservation value as the juvenile life stage of salmonids is dependent on the function of this habitat for successful survival and recruitment.

Freshwater Migration Corridors

Ideal freshwater migration corridors are free of obstruction with water quantity and quality conditions and contain natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility, survival and food supply. These corridors allow the upstream passage of adults, and the downstream emigration of outmigrating juveniles. Migratory habitat condition is strongly affected by the presence of barriers, which can include dams, unscreened or poorly-screened diversions, and degraded water quality. For successful survival and recruitment of salmonids, freshwater migration corridors must function sufficiently to provide adequate passage. For this reason, freshwater migration corridors are considered to have a high conservation value.

Essential Fish Habitat

In section 305 (b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), Congress directs Federal agencies to consult with the Secretary of the Interior with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any EFH identified. Therefore, EFH for Pacific salmon is assessed in the BA. EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity [16 U.S.C. 1802(10)]. EFH is found within the project area. Specifically, the project area contains six components of EFH which could be affected.

- Spawning and incubation
- Juvenile rearing
- Juvenile migration corridors

- Adult migration corridors
- Water quality
- Access and passage

No Action Alternative

River Lamprey

Under this alternative, all existing project components would remain unchanged, which would continue to potentially impact the ability for river lamprey to migrate upstream and out-migrate downstream of the sites. Under this alternative, potential injury or mortality would not occur to river lamprey as a result of the construction activities.

Hardhead

Under this alternative, all existing project components would remain unchanged, which would continue to impact the ability for hardhead to migrate upstream and out-migrate downstream of the sites. Under this alternative, potential injury or mortality would not occur to hardhead as a result of the construction activities. Beneficial effects to hardhead as a result of improved passage would also not occur.

California Central Valley Steelhead

Under this alternative, all existing project components would remain unchanged, which would continue to impact the ability for steelhead to migrate upstream and out-migrate downstream of the sites. Beneficial impacts from improved passage for steelhead to access upstream areas that have favorable temperatures for holding, which could improve the populations in Clover Creek, would not occur. Improved juvenile emigration for steelhead as a result of improved fish screens and bypass systems would not occur.

Fall-run and Late-Fall-run Chinook Salmon

Under this alternative, all existing project components would remain unchanged, which would continue to potentially impact the ability for fall- / late fall-run salmon to migrate upstream and out-migrate downstream of the sites. Beneficial impacts from the increased potential for fall- / late fall-run salmon to access upstream areas that have favorable temperatures for holding, which could improve the populations in Clover Creek, would not occur. Improved juvenile emigration for fall- / late fall-run salmon as a result of improved fish screens and bypass systems would not occur.

California Central Valley Steelhead Critical Habitat

Under this alternative, all existing project components would remain unchanged, therefore no modifications would occur to California Central Valley Steelhead CH. Beneficial effects to California Central Valley Steelhead CH as a result of improved passage would not occur.

Essential Fish Habitat

Under this alternative, all existing project components would remain unchanged, therefore no modifications would occur to EFH. Beneficial effects to EFH as result of improved passage would not occur.

Proposed Action Alternative

River Lamprey

Under this alternative, river lamprey could be harmed or killed by construction activities if they were present within the project area. This is considered a potentially significant impact. Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels.

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. Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels. Beneficial impacts of this alternative are expected to be similar to the beneficial impacts described below for steelhead.

Fall-run and 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 impacts to fall- / late fall-run salmon would occur as a result of implementation of the proposed project due to improvements to the current passage impediments. The proposed project was designed to improve fish passage and spawning habitat for anadromous fish species, including fall- / late fall-run salmon.

Under this alternative, fall- / late fall-run salmon could be harmed or killed by construction activities if they were present within the project area. This is considered a potentially significant impact. Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels.

Beneficial impacts to salmon would occur as a result of implementation of the proposed project due to improvements to the current passage impediments. The proposed project was designed to improve fish passage and spawning habitat for anadromous fish species, including salmon.

California Central Valley Steelhead Critical Habitat

Under this alternative, while there would be some minor changes to the habitat that currently exists upstream and downstream of the project site as a result of the instream grading and scour protection, 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 make additional habitat accessible to fish. As a result of the siphon replacement, installation of scour protection, construction of the fish ladders, a fish screen and a bypass pipe and reconstruction of the diversion canal, some of the wetland riparian habitat that has become established along the stream banks would likely be temporarily disturbed. This would result in a temporary reduction of shaded aquatic habitat. To minimize this effect, riparian vegetation would be replanted as detailed in the RPMs outlined in Appendix G 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. Beneficial impacts would occur by enhancing all three PCEs including spawning habitat, freshwater rearing habitat and freshwater migration corridors. This is not considered a potentially

significant impact. Measures would be implemented to avoid and minimize impacts to this species and to mitigate potentially significant impacts to this species to less than significant levels. A BA has been prepared to address potential impacts to California Central Valley Steelhead CH and an ESA consultation will occur with NMFS.

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 California Central Valley Steelhead CH section above. This is not considered a 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: All instream construction work shall be conducted between July 1 and October 14. Water diversions can occur before May 31, or as flows allow. Work within the channel and banks, outside of this instream work window must be isolated from flowing water, and fish passage will be accommodated through the project site after October 14.

FISH-2: All construction debris already on site and generated as a result of construction activity (concrete, metal, etc.) from the fish passage improvement-related construction activities will be removed from the active stream channel post-construction.

FISH-3: Prior to construction, exclusionary fish netting shall be installed upstream and downstream of the construction area. Specifically, a net will be installed above and below the dam/upper water crossing; above and below the siphon / bridge, and above and below the lower water crossing. Best professional determination will be used to decide which method(s) of rescue and location of exclusionary netting is most appropriate. 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, the NMFS electrofishing guidelines (NMFS 2000) will be strictly followed. The fish rescue team will be comprised of fishery biologists with professional experience using seines and electrofishing equipment.

FISH-4: All dewatering and rewatering activities will be conducted slowly, in order to minimize disturbance to fish.

FISH-5: All pumps used during dewatering or other construction activities will be screened to meet CDFW and NMFS criteria.

With incorporation of these mitigation measures (Appendix G), no significant impacts to state or federally listed animal species (with the exception of special-status animal species are expected to occur as a result of the proposed project. A “may affect, not likely to adversely affect” determination is anticipated for steelhead. This would be addressed as part of the consultation with USFWS under Section 7 of the ESA. With incorporation of the mitigation measures listed above, the project is not expected to jeopardize the continued existence of any listed species.

3.5 Cultural Resources

3.5.1 Affected Environment

Two cultural resources exist within the project area. These include the concrete MDD, and the associated siphon structure that crosses under the creek approximately 900 feet downstream of the MDD. The MDD and the siphon construction materials include concrete, rebar, pipe and scrap iron. These structures were originally built in the 1920s. Major incisions have occurred at both of these

original constructions. Gunite has been used over time to help maintain the structural integrity of the siphon.

The MDD is about 85 feet long and 12 feet wide, with a height of 4.5 feet. Today, the dam sits atop exposed bedrock, making the total height from the top of the MDD to the channel bottom approximately ten feet. Water is diverted on the north bank of the dam through a 30-inch diameter corrugated metal pipe (CMP) for about 125 feet. The water then empties into an earthen ditch for about 550 feet where it travels into a 30-inch-diameter CMP and into the siphon.

The siphon consists of a 30-inch diameter corrugated CMP approximately 205 feet long. The pipe is in a concrete encasement about 100-feet-long by 10-feet-wide where it passes underneath Clover Creek on the downstream side of a privately owned railcar bridge and then terminates in the Millville Ditch (ditch) on the south bank of the creek.

3.5.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

A comprehensive review and evaluation of potential levels of significant impacts on cultural resources was conducted by the WSRCD for the project site (WSRCD 2013). Site surveys were conducted on February 6-8, 2013, by WSRCD staff. A literature search for previous cultural resources work near the project area was completed by the Northeast Center of the California Historical Resources Information System. The results of the literature search indicated that one historic site and two prehistoric sites has previously been recorded in the general area of the proposed project. A Sacred Lands File and Native American Contacts List Request was sent to the Native American Heritage Commission (NAHC) by the WSRCD. The record search of the sacred land file failed to indicate the presence of any Native American cultural resources within the immediate project area; however a list of Native American individuals / organizations who may have had knowledge about cultural resources within the project location were provided. The NAHC provided WSCRCD with a recommendation to contact those on the list. Local tribal groups identified by the NAHC were contacted by the WSRCD with a request for information on the existence of any archaeological or cultural sites within the project boundaries. No responses were received from any individuals or organizations on the list in regards to the request for information.

The project would have a significant impact if it would:

a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5;
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5;
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
d) Disturb any human remains, including those interred outside of formal cemeteries.

No Action Alternative

Under this alternative, no impacts or changes would occur to existing cultural resources that were identified and evaluated in the project area. The identified cultural resources, including the MDD and the associated siphon, would remain unchanged. Rock protection would not be placed downstream of the two structures, so the risk of flood damage would remain the same as current conditions.

Proposed Action Alternative

Under this alternative, the MDD and siphon and small portions of the ditch system would be altered to improve fish passage and improve flood protection of the structures. The MDD and the siphon are historic and are associated with a home site and ditch that have historical roots in Shasta County. They still retain some of their original elements; however, they do not appear to retain much of their original integrity. In consideration of 36 Code of Federal Regulation (CFR) 60 criteria for potential listing of the property to the National Register, the MDD, the siphon and associated ditches are related to the agricultural and historic development of Tehama County as a whole. The elements of the MDD and siphon include construction dates in the 1920s, requiring consideration as historic properties. The MDD and conveyance tunnel do appear to possess "integrity of location, feeling and association"; some of the aspects that are considered when following 36 CFR 60. These aspects have been diminished by ongoing erosion, subsequent reconstruction and maintenance. The aspects of integrity comprised by design, materials and workmanship have been diminished by the reconstruction and maintenance of the structures since its initial construction in the 1920s.

The MDD and siphon are associated with past events. However, they do not appear to have made a significant contribution to the broad patterns of our history beyond a local level. In addition, they do not appear to be associated with the lives of significant persons in our past and do not embody distinctive architectural characteristics. There is also no additional archaeological data beyond that already collected from the site documentation and photography. Given these findings, the MDD and siphon do not wholly meet the 36 CFR 60 criteria to appear eligible for listing in the National Register (WSRCD 2013).

The proposed project would include modifications or destruction of structural elements that post-date 1975. This would not significantly alter any feature integrity. Under this alternative, no significant impacts would occur to any known cultural resource. Though undocumented, the siphon has visibly undergone modifications over time as well. It does not appear that the MDD and the siphon have any historical significance outside the context of the pattern of irrigation along Clover Creek, and the feature's research significance can be adequately addressed by further consulting the documentation reviewed by the archaeological inventory (WSRCD 2013). As such, they do not meet the 50-year guideline for consideration as historic properties.

No known archaeological or cultural sites were identified from the local tribal groups contacted by the WSRCD, and no known human remains would be disturbed within the project area. 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 resources and to mitigate potentially significant impacts to cultural resources to less than significant levels:

CULTURAL-1: In the event subsurface cultural remains over 45 years of age 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).

3.6 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 that cannot be avoided if the Proposed Action 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.

3.6.1 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 that "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; or

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 projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time."

Changes to the local environment would be made through project construction activities at the MDD, siphon, and gravel augmentation downstream of the siphon. 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 fish passage restrictions during certain flows. Improving fish passage is an important factor that 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 that have been implemented by the CCWMG, WSRCD, NRCS, CDFW and / or the USFWS over the past approximately 20 years. These projects include but are not limited to, establishment of a water quality monitoring program, fish passage restoration, development of conservation easements, gully restoration, riparian habitat restoration, outdoor education, pasture restoration, streambank stabilization, non-native vegetation control and fuels management. Additionally, multiple restoration projects are anticipated in the future as funding is available, including a 1.5-acre riparian forest buffer along Clover Creek upstream of the dam. A maintenance agreement between CDFW and MDC is currently being prepared regarding the maintenance of the fish ladders and fish screen. This agreement will identify the responsibilities of each party. Fish ladder and screen maintenance activities will likely include use of hand tools to clean out debris and remove accumulated sediments. A California Fish and Game Code Section 1600 Lake and Streambed Alteration Agreement will be obtained from CDFW for the project maintenance activities.

The cumulative impacts of these projects and the Clover Creek / Millville Diversion Fisheries Restoration Project are not anticipated to be negative, and in fact should improve natural resource conditions for anadromous fish and other native species in the Clover and Cow Creek watersheds. In addition, AFRP has recently implemented and is planning several other anadromous fish passage improvement projects on several Sacramento River tributary streams. The cumulative impacts of these projects and the Clover Creek / Millville Diversion Fisheries Restoration 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.

3.6.2 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 that 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 that would result in conditions that would be irreversible though 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 activities, 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; 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.

3.6.3 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 Clover Creek and downstream in Cow Creek and 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 enhance and restore habitat for native fish and wildlife species. Implementation of the proposed project would not sacrifice the long-term productivity of the project area for short-term uses during construction.

3.6.4 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 that growth. Analysis of

growth-inducing impacts includes those characteristics of an action that may encourage and facilitate activities that 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.

3.6.5 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 that 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 would be developed to comply with CEQA. The mitigation measures that were identified as part of this analysis, and that would be included in the MMRP, are listed in Appendix G.

3.6.6 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 / greenhouse gas emissions, cultural resources, soils and geology, hydrology and water quality, fisheries, vegetation, wildlife, hazards and hazardous wastes, noise and wetlands. These potential effects are discussed in the individual resource sections of this document. As part of the environmental impact assessment for each resource area, mitigation measures have been identified that 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.

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 (88.8 percent) of Shasta County’s population is white or Caucasian (U.S. Census Bureau 2015). Minorities of African American, Asian, Hawaiian or Pacific Islander, and Hispanic ethnicity comprise the remaining 11.2 percent of the county’s population. Per capita personal income for Shasta County was $23,670, below the State average of $29,527. Shasta County had an unemployment rate (not

seasonally adjusted) of 11.2 percent in December 2014 (U.S. Department of Labor-Bureau of Labor Statistics 2015). There are two residences located in the vicinity of the gravel augmentation site.

3.7.2 Environmental Consequences / Impacts and Mitigation Measures

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 that 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 to the MDC diversion and water conveyance system. The water conveyance system would continue to convey water from the MDD and through the siphon to MDC customers. The diversion and water conveyance structures would be upgraded to improve native fish passage at the MDD and siphon and gravel augmentation would occur downstream of the siphon.

Minority and low-income residents live in the general vicinity of the project area; however, there is no evidence to suggest that the project would cause a disproportionately high adverse human health or environmental effect on minority and low-income populations as compared to other residents of the area. The known health risks to residents that could be associated with the project are evaluated in the sections of this document related to water quality, air quality, hazardous materials and noise. For the most part, these health risks are associated with the construction aspects of the project, in that residents could be exposed to hazardous materials that may be associated with construction activities. 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 disproportionately negative effect on any minority or low-income population.

3.8 Soils / Minerals and Geology

3.8.1 Affected Environment

<u>Soils</u>

Six soil map units occur within the project area (Figure 16) according to the local soil survey [U.S. Department of Agriculture – Soil Conservation Service (USDA-SCS) et al. 1974] (note that the soil survey map below includes the former rock harvest area). The six identified map units are listed below:

<u>Cobbly alluvial land, frequently flooded (Ck)</u>

This soil map unit exists on floodplains and in old channels of larger streams and is excessively-drained and has very rapid permeability. Runoff is very slow and the hazard of erosion is very severe. The series is not classified taxonomically by higher categories in the soil survey.

Honn fine sandy loam, 3 to 8 percent slopes (HgB)

This soil map unit is found on well-drained soils on low terraces along lower Cow Creek and its tributaries. Permeability is moderately slow and runoff is slow to medium. Erosion hazard is slight to moderate. The taxonomy of the series is loamy mixed thermic, Mollic Haploxeralfs.

Inks-Pentz complex, 30 to 50 percent slopes (IeE)

This series is made of well-drained to excessively-drained soils that are located on top of cemented, tuffaceous sediment. Runoff is rapid and erosion is high. The taxonomy of the series is loamy-skeletal, mixed, thermic, Lithic Argixerolls.

Los Robles loam, 0 to 3 percent slopes (LcA)

This soil is moderately well-drained that is formed in alluvium from dominantly basic rock. It is located on low terraces and fans along streams. Runoff is very slow and erosion is none to slight with moderately slow permeability. The taxonomy of the series is fine-loamy, mixed, thermic, Mollic Haploxerolls.

Myers silty clay, 0 to 3 percent slopes (MrA)

This soil map has slow permeability with very slow runoff and the erosion hazard is none to slight. The soil is located on intermediate terraces and fans and formed in alluvium from sedimentary material. The taxonomy of the series is fine montmorillonitic, thermic, Entic Chromoxererts.

Rockland (RxF)

This soil map unit is found in nearly level to very steep uplands of mountainous areas. Rock outcroppings cover 25 to 90 percent of the surface area. The series is not classified taxonomically by higher categories in the soil survey.

Geology

The project site is located near the border of the eastern perimeter of the Great Valley geomorphic province of California and western perimeter of the Sierra Nevada geomorphic province. The Great Valley is an alluvial plain approximately 50 miles wide and 400 miles long in the central part of California. The Great Valley is a structural depression that has been filled with a thick sequence of Mesozoic and Tertiary marine sediments covered by Quaternary alluvial sediments. The Sierra Nevada is a tilted fault block with a steeply-dipping eastern slope and gently-dipping western slope covered with alluvial sediments. The project site is located at an elevation of approximately 560 to 565 feet above sea level. At the location of the MDD and siphon, an alluvial plain approximately 0.2 miles wide is situated to the northwest of Clover Creek and a narrow ridge with elevations of up to approximately 690 feet above sea level is located immediately to the southeast of the creek.

Site Geology

The dam structure is constructed on bedrock of the Cretaceous Chico Formation. The formation consists of siltstone that is very friable and slakes when exposed to sunlight and air. The deposits at the project site are primarily composed of loose colluvial and alluvial cobbles and gravel within a sandy matrix overlying bedrock. These loose deposits are extremely susceptible to erosion and changes due to water flows. Bedrock at the site is exposed locally in bank cuts along the creek and in the base of the channel,

and is composed of very thinly-bedded to moderately-bedded, moderately-weathered sandy siltstone and shale. Local beds of competent, hard siltstone form erosion-resistant benches in the banks of Clover Creek, but exposed bedrock is generally friable and slakes when wet. This is evidenced by the undercutting which has occurred beneath the downstream sides of the MDD and siphon.

Geologic Observations

There is evidence of undercutting on the downstream side of the MDD and plunge pool due to the siltstone formation. There is also approximately 800 cubic yards of sediment built up behind the dam. The siphon site has very little alluvium trapped behind it and very little sediment would wash downstream as a result of construction activities. There is the possibility of downstream head cutting into the siltstone bedrock if the siphon or MDD are removed or changed; however, these structures are not planned to be removed.

3.8.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

The geology and soils analysis is based on information in the *Soil Survey of Shasta County Area, California* (USDA-SCS et al. 1974), 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 2013a) and the *Design Summary Report: Draft 100% Clover Creek/Millville Diversion Fisheries Restoration Project Millville, California* (Sage Engineering 2015).

Significant impacts would occur if the project would:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving earthquake fault rupture, seismic ground shaking, liquefaction or 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 onsite or offsite landslide, lateral spreading, subsidence, liquefaction or collapse’

d) 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

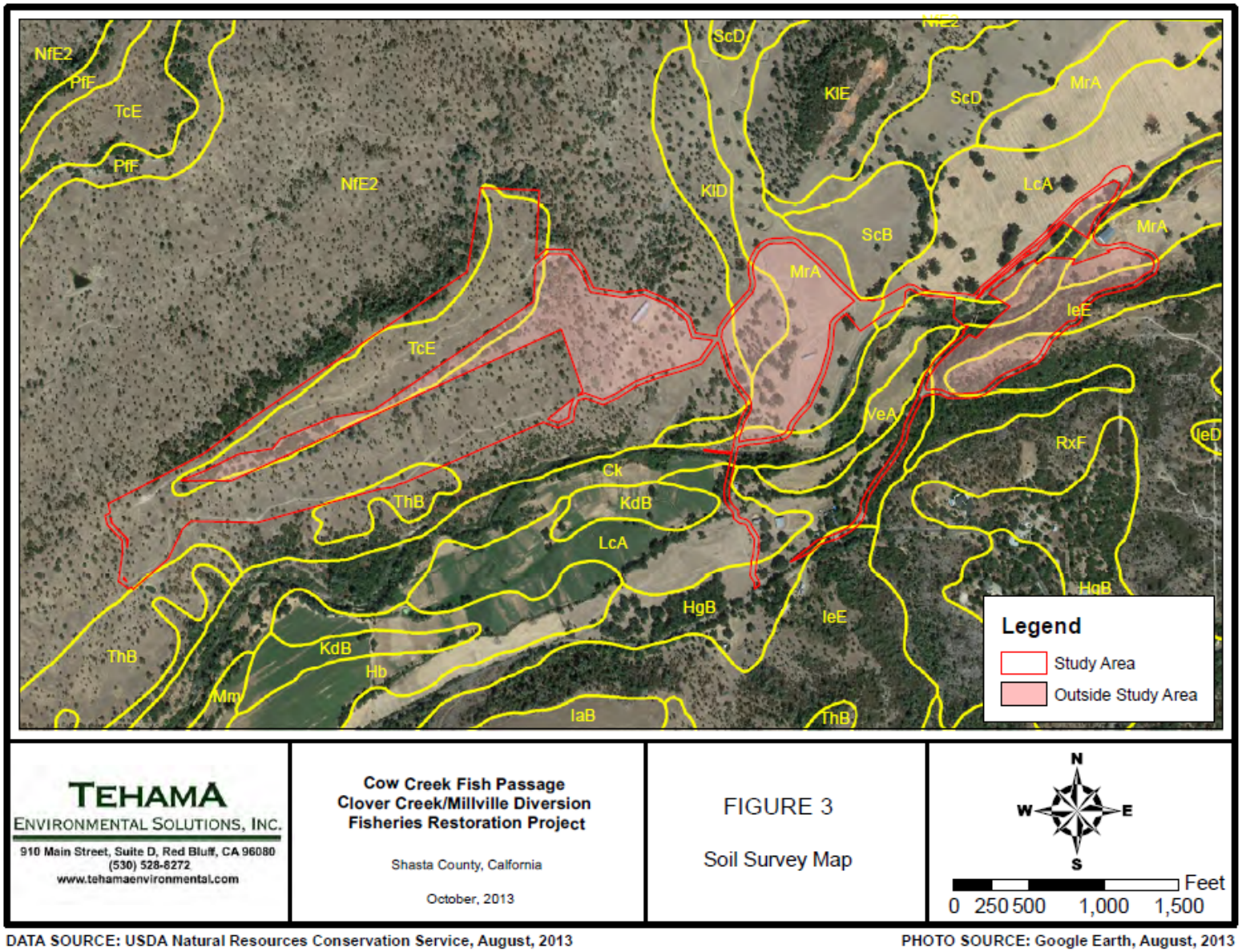
e) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

No Action Alternative

Under this alternative, there would be no impact to soils, minerals or geology due to the fact that the MDD and the siphon and associated infrastructure would not be retrofitted or replaced. The existing structures would all remain in place and the spawning gravel augmentation would not be implemented. Rock protection would not be placed downstream of the two structures, so the risk of flood damage would remain the same as current conditions.

Figure 16. Soils Survey Map for the Clover Creek / Millville Diversion Fisheries Restoration Project

(Source: TES 2013)



Proposed Action Alternative

Under this alternative, no known mineral resources of value or mineral resource recovery sites would be disturbed or lost. No permanent structures or facilities would be constructed that expose structures and / or people to geologic hazards. 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. A search of the Alquist-Priolo Earthquake Fault Zoning Map (http://www.quake.ca.gov/gmaps/WH/regulatorymaps.htm) shows there are no Earthquake Fault Zones or Landslide and Liquefaction Zones of regulatory interest within or surrounding the project area. The project does not include elements that would cause ground failure (including liquefaction) or landslides and is not located on expansive soils.

Construction-related ground disturbances would occur as a result of the excavation for the new siphon, the installation of the new fish screens and ladders on the siphon and MDD, and other work associated with the retrofitting and upgrades. Substantial soil erosion or loss of topsoil could occur as a result of the ground disturbance which is considered a potentially significant impact.

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

SOIL / GEO-1: After ground-disturbing activities are complete, all disturbed areas (outside of the active stream channel) shall be seeded with native plant species and mulched as described in the revegetation plan.

SOIL / GEO-2: Construction of all project actions shall comply with RWQCB Basin Plan Objectives. Standard BMPs will be incorporated into the project designs and / or SWPPP, if required.

SOIL / GEO-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 Stormwater Associated with Construction Activity and a SWPPP will be prepared.

SOIL / GEO-4: For site grading, on-site materials may be used as engineered fill, provided they are prepared free of organics, trash and other debris, they do not contain oversize particles larger than 2.5 inches in greatest dimension, they have no more than 35 percent passing the No. 200 sieve, they have little to no corrosion potential and have a relatively low expansion potential, defined by a liquid limit less than 40 and a plasticity index lower than 20. If imported fill is used, it shall be submitted to the geotechnical engineer of record for approval at least 72 hours before it is to be used on site.

Compaction Requirements: Engineered fill, where planned, shall be placed in maximum eight-inch-thick loose lifts, moisture-conditioned to within two percent of optimum moisture content, and compacted to at least 90 percent relative compaction. Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density of the same material, as determined by ASTM D1557 laboratory compaction procedure. (Source: Sage Engineers 2015)

SOIL / GEO-5: Where temporary excavations are required, temporary slopes will be used. Temporary slopes shall be excavated in accordance with the latest edition of the CAL-OSHA excavation and trench safety standards as a minimum (OSHA 2012, OSHA Standards for the Construction Industry, 29 CFR Part 1926). The sand / gravel / cobble matrix present at the site shall be preliminarily classified as Type C according to the CAL-OSHA classification system. The maximum allowable slope for Type C soil is 1.5H:1V; however, flatter temporary slopes may be required to provide a stable slope, especially where

there are low fines contents. Where encountered, bedrock shall be classified as Stable Rock, for which vertical cuts are allowed; however this shall be confirmed in the field once exposed. The Contractor is responsible for all temporary slopes at the site, and shall designate one of their on-site employees as a "competent person" who is responsible for trench and excavation safety. The competent person shall be responsible for determination of the actual CAL-OSHA soil type and shall direct the excavation crews to adjust slope inclinations if appropriate. If temporary shoring is used, the Contractor shall retain the services of a design engineer familiar with shoring system design in creek deposits. (Source: Sage Engineers 2015)

SOIL / GEO-6: Where permanent cut and fill slopes are required in soil, they shall be constructed with a maximum inclination of 2H:1V. Cut slopes in the bedrock shall be excavated to inclinations of 1H:1V, but shall be confirmed in the field by a Certified Engineering Geologist during construction based on the actual conditions encountered. Steeper permanent slopes in rock cuts may be feasible as determined by the Geologist. (Source: Sage Engineers 2015)

SOIL / GEO-7: All creek crossings associated with construction / project activity shall occur only at the two designated low water crossings.

3.9 Hazards and Hazardous Wastes

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 State Route (SR) 44, 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 project site is located within an area that is designated as a Very High Fire Hazard Severity Zone on the Shasta County Fire Hazard Severity Zone map (California Department of Forestry and Fire Protection [CALFIRE] 2015).

3.9.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

The hazards and hazardous wastes analysis is based upon a review of a governmental record search of the California Department of Toxic Substances Control (DTSC) EnviroStor database (DTSC 2015).

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 for people residing or working in the project area;

f) For a project within the vicinity of a private airstrip, the project would result in a safety hazard for people residing or working in the project area;

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

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. Since the project area is not located within an airport land use plan or in the vicinity of a private airstrip, 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, the result of the EnviroStor database search indicated that there are no known hazardous waste and substances sites located within five miles of the project site. Activities associated with the proposed project would utilize potentially hazardous materials during project construction, including operation of vehicles and use of 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 Shasta County. The widespread use and associated transport of these materials along the highways and county roads that traverse Shasta County, combined with the low level of incidents (spills), suggest that 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 that 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 and the project is located in an area designated as a Very High Fire Hazard Severity Zone. Under the proposed project, construction activities would occur within, or adjacent to the riparian corridor of Clover Creek. Potential fuels within

the boundaries of the site are generally noncontiguous especially at the Millville Dam site 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 that currently exist. 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 to hazards and hazardous wastes and to mitigate potentially significant impacts to hazards and hazardous wastes 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 will be developed and used following the Standard California Department of Transportation Temporary Concrete Washout Plan.

HAZ-2: Construction equipment and building materials shall not be stored or stockpiled in the creek channel, and shall be stored at least 50 feet from the top of the bank.

HAZ-3: No petroleum-based products shall be used as soil stabilizing material.

WATER-2 through **WATER-7** associated with wet concrete and potential petroleum product spills will be fully implemented.

3.10 Hydrology and Water Quality

3.10.1 Affected Environment

The project site is located on Clover Creek, a perennial stream and one of six main tributaries of Cow Creek. These waters originate at Clover Mountain, approximately 5,500 feet in elevation and eventually flow into Cow Creek and then into the Sacramento River 10.5 miles below the Clover Creek and main stem Cow Creek confluence. The Cow Creek watershed includes a total area of 274,684 acres (134 square miles). The Clover Creek watershed encompasses includes a total area of 34,917 acres, approximately 13 percent of the Cow Creek watershed area (SHN and Vestra 2001]. No other perennial streams are present within the project site, however there are a few intermittent and ephemeral streams in the project area that drain to Clover Creek.

Water Quality

Bacteria concentrations, water temperature and turbidity associated with spring runoff are identified as the important factors impacting water quality of Clover Creek. However, the current level of water quality and quantity information for the Cow Creek watershed is not adequate to characterize system-wide conditions and is insufficient to document long-term trends.

Bacteria

Clover Creek water quality is listed by the EPA and the California State Water Resources Control Board as impaired for pathogens. The leading cause of impairment is bacteria. The 2010 CWA Section 303(d) List of Water Quality Limited Segments lists Clover Creek as impaired for fecal coliform along 11 miles. Fecal coliform bacteria is a primary concern within the watershed as a result of the important implications for communities and anadromous fish populations. Fecal coliform threaten drinking water and recreational contact users, and in conjunction with warm summer water temperatures, heavy microbial oxygen demand could affect aquatic species by decreasing the available dissolved oxygen (Hannaford and North State Institute for Sustainable Communities 2000).

Data collected from 2004 and 2005 indicate that *Escherichia coli* (*E. coli)* concentrations regularly exceed safe public contact thresholds in several reaches of the Clover Creek watershed from lower to higher elevations (Hannaford and WSRCD 2006). Stormwater runoff was associated with some high *E. coli* events and several locations maintained high concentrations of *E. coli* during non-runoff periods (Hannaford and WSRCD 2006). The actual source of fecal coliform is unknown and untested. Possible sources include wildlife defecating near streams, livestock waste entering the streams, or human septic systems or sewage lines leeching into the streams (Hannaford and North State Institute for Sustainable Communities 2000).

Temperature

Water temperature in Clover Creek is an important parameter for species such as fall-run salmon, trout and steelhead. Concerns with temperature apply mainly in the lower reaches of Clover Creek below Clover Creek Falls, a natural fish barrier, and are closely related to instream flow conditions. See Section 3.4.4 Fisheries, for more information on water temperatures within Clover Creek.

Mercury

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 an important activity historically within the Cow Creek watershed (SHN and Vestra 2001). Since the mid-1860's, copper, coal, gravel and dimension stone have been mined from the Cow Creek Watershed. Gravel was mined in the lower reaches of the main stem of Cow Creek in active floodways and has likely reduced available spawning gravel in those areas of mining (SHN and Vestra 2001).

The Afterthought and Donkey Mines and the Ingot copper smelter were located in the Cow Creek Watershed in the Little Cow Creek sub-watershed. A mercury and cinnabar mine referred to as the "Clover Creek Mine" or "Clover Creek Cinnabar Mine" is located on Rosebriar Creek, a tributary to Clover Creek, approximately 11 miles upstream of the project site (Western Mining History 2015). This mine was prospected intermittently between 1898 and 1915 but no commercial-grade ore was found. Mercury deposits are known to occur at the mine site however there are no records of when the last year of production took place at this mine.

Groundwater Quality

The project site falls just outside of the Redding Area Groundwater Basin (RAGB) in the Millville subbasin. Groundwater in the RAGB is typically sufficient for municipal, industrial and agricultural uses, averaging less than 400 milligrams / liter (mg / l) total dissolved solids (TDS). This range is below both the California and EPA secondary drinking-water standard of 500 mg / L TDS and the agricultural water quality limit of 450 mg / L TDS.

Hydrology

Clover Creek receives its stream flow from spring / summer snowmelt and winter storm rainfall and runoff. Annual precipitation within the watershed ranges from about 25 inches in the valley areas to about 65 inches in the northeastern mountainous portion of the watershed (SHN and Vestra 2001). From 75 to 90 percent of the annual total precipitation is received between November 1 and April 30 and while summer thundershowers commonly occur in the mountainous areas, they account for only a small percentage of the total annual supply of moisture. The Cow Creek watershed ranks third behind

the Cottonwood Creek and Stony Creek watersheds for producing the largest peak flood flows within the northern Sacramento Valley (SHN and Vestra 2001). It has been estimated that flood flows from the Cow Creek watershed account for approximately 21 percent of the peak discharge for the Sacramento River between Shasta Dam and Red Bluff (SHN and Vestra 2001).

Water diversions and water use for irrigation, recreation, and hydropower in the Cow Creek watershed are likely to heavily influence the hydrology as Cow Creek is a fully adjudicated stream. Stream flow in Cow Creek and its tributaries is typically at very low levels during the summer season, particularly in the middle and lower reaches. Low flow conditions impact water quality (through concentration of chemical constituents), limit recreational use and aesthetics, and reduce available aquatic habitat. The timing and success of anadromous fish use is largely dependent on available stream flow during the fall for in-migration of adults and the spring for out-migration of juveniles.

The USGS maintains a gauging station on the main stem of Cow Creek, near Palo Cedro (gauge basin area of 425 square miles). This gauge has a 40-year continuous record (1950 to current; station number 11374000). Section 3.4.4.1 has more information on average monthly flows in Clover Creek.

Water Rights

Cow Creek is a fully adjudicated stream. According to the water rights investigation, water rights on Clover Creek were established under Judgement and Decree 6904, dated October 4, 1937 (Snodgrass 2013). A maximum of 23.6 cfs can currently be diverted from Clover Creek and its tributaries during the irrigation season from May 1 through October 31 of each year for domestic, stock watering and irrigation purposes (Snodgrass 2013).

The decreed water right for MDC is 4.4 cfs. Mr. Chad Oilar, a water right holder in the MDC also owns property with decreed water rights upstream of the dam. These rights are not exercised at the upstream location but rather are diverted at the MDC ditch. Currently, the MDC ditch is used to divert two different water rights (for the MDC and Mr. Oilar). Therefore, the maximum water right at the MDC ditch is 6.5 cfs (Snodgrass 2013).

Additionally, according to the decree, when there is a surplus of water in Clover Creek, above the flow necessary to supply all water rights on Clover Creek the surplus may be apportioned amongst the parties. The total of all of the water rights in Clover Creek is 23.6 cfs (Snodgrass 2013). The MDC water right is 27.6 percent of the total water right. Based on the total water right MDC could take up to 27.6 percent more water during higher creek flows; however, the maximum amount of water that could be diverted into the MDC ditch is 8.2 cfs (Snodgrass 2013).

Hydraulic Analysis

The initial Snodgrass (2013) study focused on average daily flows typical of fish passage studies. The nearest stream gauge to the project site is located on Cow Creek downstream of its confluence with Clover Creek. The watershed area above the project area is about 13 percent of the total watershed contributing to Cow Creek at the gauge site. For analyzing typical daily flows, Snodgrass (2013) assumed flows at the project site were about 13 percent of those observed at the Cow Creek stream gauge. This assumption was verified by comparing flow measurements on Clover Creek with the Cow Creek Gauge.

DWR (2013) also constructed a steady-state, one-dimensional Hydrologic Engineering Center River Analysis System (HEC-RAS) model of the project reach. The model extended about 2,700 feet total, from about 600 feet downstream of the siphon to about 1,300 feet upstream of the MDD. The model included 52 cross-sections spanning the width of the channel, but did not include the floodplain. The model was calibrated for a low flow event of 165 cfs and run for flows up to bank full discharge of about

3,000 cfs.

The low flow adjustments and model are appropriate for evaluating fish passage conditions through the project area. A model of high flow conditions was required to ensure that the project would not have a negative effect on the flood conveyance through the reach, and to determine stable rock sizes for the rock slope protection recommended at the diversion site and siphon. The flow with a one percent annual probability of exceedance (the 100-year flow event) is typically used in these studies.

The 100-year annual exceedance discharge for Clover Creek was determined from scaling the 100-year discharge from the Cow Creek gauge. Table 7 shows expected reoccurrence interval for flows at the Cow Creek gauge and adjusted to the project site. The reoccurrence of flows was determined using the USACE HEC-Statistical Software Package (SSP) 2.0 software with peak flow events recorded at the Cow Creek gauge between 1912 and 2012. Flows at the project site are 13 percent of the flow at the gauge consistent with the findings of Snodgrass (2013). MDC representatives at the November 6, 2014 TAC meeting noted that overbank flows which flank around the north bank of the MDD occurred nearly annually prior to the construction of a concrete berm on the north bank. Without the concrete berm in place, the Snodgrass (2013) HEC-RAS model shows that the diversion would be flanked when flows exceed about 1,500 cfs. According to Table 7, this event would occur nearly annually. The agreement of the observation and model suggests the 13 percent flow adjustment is a reasonable adjustment for high flow events as well. Reasonable agreements between model results for the December 12, 2014 high flow event and visual observations at the site were also shown. Scaling the 100-year flow at the Cow Creek gauge provides a 100-year event at the MDD of 7,000 cfs.

Table 7. Peak Flow Events on Cow Creek and Clover Creek.

Peak Flow Events as computed at the USGS Gauge on Cow Creek translated to the Project Site. (Source: NHC 2015)

Annual Percent Chance Exceedance (%)	Typical Reoccurrence Interval (Years)	Flow at Cow Creek Gauge (cfs)	Flow at Project Site (cfs)
0.2	500	65,189	8,475
0.5	200	58,859	7,652
1	100	53,950	7,013
2	50	48,879	6,354
5	20	41,879	5,444
10	10	36,231	4,710
20	5	30,121	3,916
50	2	20,492	2,664
80	1.25	13,278	1,726
90	1.11	10,347	1,345
95	1.05	8,312	1,080
99	1.01	5,307	690

NHC created a two-dimensional Sedimentation and River Hydraulics Two-dimensional Model (SRH-2D) of the project area to evaluate the 100-year flow event conditions through the reach. The objective of the model was to define hydraulic conditions for sizing of the rock stabilization recommended at the MDD and siphon and to evaluate potential negative flood impacts of the projects.

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, including hydrologic studies conducted for the project (Snodgrass 2013, NHC 2015, Sage Engineering Inc. 2015). 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;

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation onsite or offsite;

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite;

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;

f) Otherwise substantially degrade water quality;

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;

h) Within a 100-year flood hazard area, structures which would impede or redirect flood flows;

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; or

j) Inundation by seiche, tsunami, or mudflow.

No Action Alternative

Under this alternative, no changes would occur to the existing MDD, siphon or diversion infrastructure. No changes to the unscreened diversion flows would occur. No impacts to water quality or hydrology / hydraulics would occur. Beneficial impacts to the stream from reinforcements and upgrades to the siphon and MDD would not occur.

Proposed Action Alternative

Under this alternative, water quality impacts to Clover Creek could occur as a result of the piping of the ditch, if work were to occur when the ditch was flowing and water return flows were to reenter the creek. This is considered a potentially significant impact.

Under this alternative, water quality impacts to Clover Creek could occur if fuel, oil or 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.

Under this alternative, 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 Clover Creek and potential distribution of mercury. However, because Clover Creek does not have a significant mining history, erosion control features would be put in place

before and during construction activities. Dewatering would occur slowly to avoid increasing turbidity, the amount of sediment redistributed would be minor, and turbidity would be minimal, therefore, there are no expected impacts. BMPs for turbidity control in the work areas address any potential discharge of mercury bearing sediment.

A short-term minor increase in turbidity and suspended sediments would likely occur immediately following placement of the spawning gravel. This is considered a significant impact. This augmentation of spawning gravel routing through the project reach below the low water crossing, downstream of the siphon would improve ecological processes that are expected to benefit all native fish and wildlife species. This gravel would create additional spawning and rearing habitat for salmonids.

The redistribution of sediment following rewatering of the channel after construction of the fish ladders, fish screen and the new siphon would likely cause a minor temporary increase in turbidity in Clover Creek. However because the amount of sediment is small, and mobilization would occur primarily during high flows when background turbidity and sediment transport is relatively high, these impacts are considered less than significant.

This alternative would not impact groundwater supplies, increase onsite or offsite flooding, contribute additional run-off water, place housing within flood hazard areas, place structures that would impede or redirect flood flows, expose people of structures to flooding impacts, or cause inundation by seiche, tsunami or mudflows.

The proposed project increases water elevation levels locally near the structures due to the presence of the ladders and rock stabilization. According to the hydraulic model, the proposed project conditions show identical water surface elevations upstream and downstream of the project indicating the project would not have an overall effect on the flood conveyance capacity of the channel (Figure 17). The project would not increase flood levels on Clover Creek during a 100-year flood event.

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 construction shall be conducted in the summer / early fall during the low flow period. 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: BMPs will be developed and implemented to ensure that wet concrete does not enter Clover Creek during construction.

WATER-3: Monitoring of water turbidity and settleable materials shall be conducted in accordance with the Clean Water Act Section 401 Certification through consultation with the Central Valley Water Board.

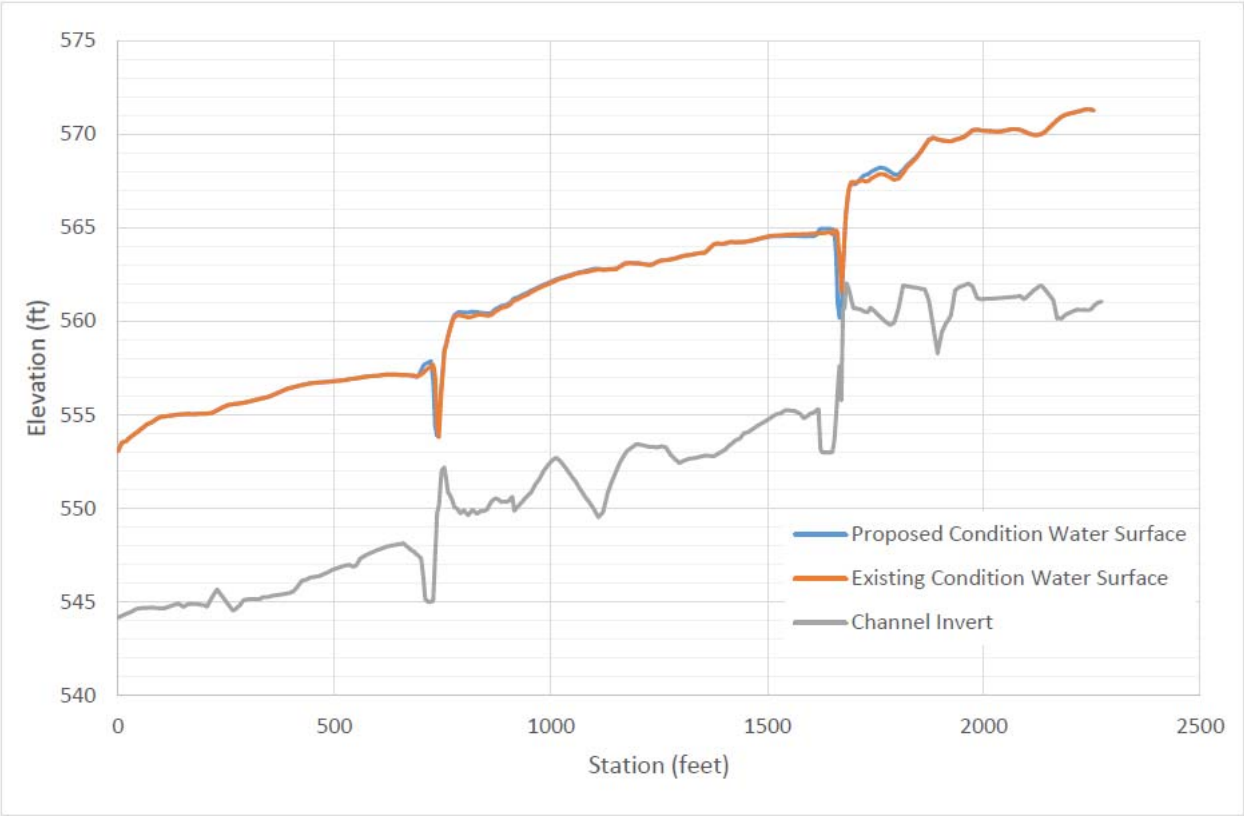
WATER-4: All equipment and machinery that contains fuel, oil or other petroleum products used during construction-related activities shall be checked for petroleum leaks immediately prior to being mobilized to the project site and again each day prior to use.

WATER-5: All equipment refueling and / or maintenance shall take place within a secondary containment structure and a minimum of 100 feet away from Clover Creek or other aquatic sites.

WATER-6: An emergency spill kit and absorbent oil booms will be onsite during construction activities.

Figure 17. Future Project Water Surface Elevations

SRH-2D computed water surface elevations through the project reach during the 100-year flow event (Peak Flow = 7,000 cfs). (Source: NHC 2015)



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

WATER-8: A dewatering permit will be obtained from the Central Valley Water Board for each project site, if deemed necessary, based on the dewatering methods used.

3.11 Land Use

3.11.1 Affected Environment

The Shasta County General Plan designation for the project site is Commercial Agriculture, Agriculture – Grazing – Prime Agriculture. The Shasta County zoning designation for the project site is zoned Exclusive Agricultural (EA) District and Agricultural Preserve (AP) District (Shasta County 2015). The project site is within the Eastern Upland Planning Area of the Shasta County General Plan. This planning area is located in the south central portion of the County and includes the communities of Millville, Oak Run and Whitmore. This area supports large land areas held mostly in public ownership and lands utilized for grazing. Road access within the Eastern Upland Planning Area is provided primarily by SR 44, which runs east-west and SR 299 which runs north-east and south-west across the south central portion of the County. The primary north-east and south-west running county roads in the Eastern Upland Planning

Area are Dersch Road, Whitmore Road and Oak Run Road. The primary north-south roadways within the Eastern Upland Planning Area are Millville Plains Road and Deschutes Road.

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 Shasta County General Plan, and Zoning Plan in relation to surrounding land uses and site features. The analysis was conducted through document review, site visits and discussions with Shasta County staff.

Impacts to land uses would be significant if they would:

a) Physically divide an established community;

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect; or

c) Conflict with any applicable habitat conservation plan or natural community conservation plan.

No Action Alternative

Under this alternative, no change of land use or activities would occur. Diverted flows from Clover Creek would continue to service the private agricultural and residential uses of the MDC members. Diversions would continue to supply water for irrigation and livestock water. There would be no impacts to the current land use.

Proposed Project Alternative

Under this alternative, construction may require permitting by the Shasta County Resource Management Department's Planning and Building Divisions. The project area is located within Shasta County's EA and AP land use zone, which limits land uses to further agriculture production and related activities. The project would involve constructing retrofits to the irrigation infrastructure which provides water to the landowners and MDCs existing agricultural uses, therefore the work fits within acceptable improvements in the land use zone. The proposed project remains consistent with the goals, policies, and objectives of the Shasta County General Plan and Zoning Plan and there would be no physical division of an established community; however, Shasta County requires project plans to be reviewed by the Planning Department to ensure that activities meet the allowable land use for the designated zoning of the area. Project implementation would not interfere with, preclude, or conflict with existing land uses adjacent to the project area. There would be no conflicts with any applicable habitat conservation plan or natural community conservation plan. 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 potential sensitive receptors (those within 0.65 miles of the project site), three near the gravel augmentation site, seven sensitive receptors near the siphon and four sensitive receptors near the MDD. These potential receptors were located within the

Clover Creek corridor to the south of Clover Creek. The closest potential sensitive noise receptors to the gravel augmentation site is a domestic residence, located approximately 225 feet from the gravel augmentation site. This residence is owned by the property owner implementing the project; however it is used as a caretaker's residence and is currently occupied by the caretaker. The closest potential sensitive noise receptor to the siphon site is approximately 0.26 miles from the siphon. The closest potential sensitive noise receptor to the MDD site is approximately 0.49 miles from the MDD. Land uses at these locations appear to be residential in nature, but could not be accurately identified from aerial photography.

The area surrounding the project site is moderately rural with unpaved road access to the project site. There is limited daily traffic noise in the area of the project site due to the rural agricultural and residential uses. There is existing ambient and background noise associated with Clover Creek, the siphon and MDD spillways and varied wildlife activities. Varying ambient noise levels at the siphon and MDD are dependent upon the volume of water flowing over the structures. There are also existing background noise levels associated with ongoing agricultural operations on the property which include activities such as discing and harvesting, as well as vaccinating, branding and cattle / calf marking.

3.12.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

Construction noise related to the site improvements at the MDD, siphon and gravel augmentation site, is 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) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels;

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;

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, expose people residing or working in the project area to excessive noise levels; or

f) For a project within the vicinity of a private airstrip, 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 2.9 miles of paved public roads and 1.6 miles (the north and south access roads) of unpaved private roads from State Route (SR) 44. Due to the weight of the equipment necessary to perform the project construction, transportation of heavy

equipment would be required to use the north access route and the low water crossing at the gravel augmentation site, once they access the site on the private unpaved roads.

During the construction phase of the project, noise from construction activities would temporarily impact the environment in the immediate area. The noise levels of typical construction equipment that could be used to implement the project are shown in Table 8.

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 all three sites could encounter increased noise levels during construction activities, in excess of the Shasta County General Plan standards of 55 Energy-Equivalent Level (LEQ) (100 feet from residences), during the hours of 7 a.m. and 10 p.m. (Shasta County 2004), 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 excavators, loaders, etc., may operate in a cyclical fashion in which a period of full power is followed by a period of reduced power and noise. Any impacts would be temporary and localized, however this is considered a potentially significant impact.

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, as recreational uses in the project areas are limited due to the fact that the project site is located on private property with controlled access. Noise impacts to recreational uses are considered less than significant.

Table 8. Typical Construction Equipment Noise
Source: Federal Highway Administration Roadway Construction Noise Model

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

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 would be no noise related impacts to public airports or privately owned airstrips adjacent to or within the project area.

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

NOISE-1: Construction work (including arrival and departure of trucks hauling materials) will generally be conducted from 7:00 am to 7:00 pm Monday through Friday. Weekend work will only be allowed, if necessary to complete the projects within the established environmental time frames.

3.13 Population and Socioeconomic Resources

3.13.1 Affected Environment

The project site is located on three remote private parcels totaling approximately 993 acres and serving one primary residence, one caretaker's residence 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.

The project would have a significant impact if it would:

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure);

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; or

c) Displace substantial numbers of people, 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 population growth in the area, either directly or indirectly. The project improves fish passage conditions at the siphon and MDD sites, however it does not extend the infrastructure or increase production capacity. The project structures currently serve only those members of the MDC with water rights associated with Clover Creek. 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 that would directly or indirectly influence local or regional population growth.

3.14 Public Services and Utilities / Energy

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 MDC.

3.14.2 Environmental Consequences / Impacts and Mitigation Measures

Methodology

An impact related to Public Services and Utilities / Energy 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:
    1. Fire protection
    2. Police protection
    3. Schools
    4. Parks
    5. Other public facilities

b) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;

c) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;

d) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;

e) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed;

f) 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;

g) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs; or

h) Comply with federal, state, and local 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, no activities would occur to disrupt or require any new government facilities. Site irrigation needs would continue under existing entitlements. No public stormwater infrastructure, wastewater treatment or additional landfill service is needed.

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). Disposal of potentially hazardous waste is evaluated in Section 3.9, Hazards and Hazardous Wastes. Construction would not have a significant effect on local or regional energy sources. Contractors would be responsible for their own utilities during construction activities. No impacts would result to public utilities and services in the project area as a result of the proposed project.

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. Fishing opportunities occur along Clover Creek, however access is limited due to the fact that the majority of the property in Clover Creek is held in private ownership. 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 the potential effect on recreation 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 Shasta 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 types of recreational activities within the project area, as well as upstream and downstream of the gravel augmentation site, the siphon site and the MDD 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 all project site landowners. During project construction activities, a limited duration of increased noise in the general area of the project site would occur that could potentially impact recreational uses for a short time, in particular hunting activities in the general area. However, because recreational use of the area appears to be light, and recreational uses are also available farther away from the project site, coupled with the fact that the impact would be short in duration, this is considered a less than significant impact.

Under this alternative, beneficial impacts to recreation may result from increased fish populations, both locally and regionally. Mitigation measures that have been developed for potential noise and water quality impacts would be implemented to make sure that any materials released into the river, or noise

generated from construction activities that could cause a nuisance or adversely affect recreation uses would not result in a significant impact. Refer to Section 3.12 for noise mitigation measures and Section 3.10 for water quality mitigation measures.

3.16 Transportation

3.16.1 Affected Environment

SR 44 is the main highway near the project site. From SR 44, the project site would be accessed from Old Highway 44 heading north to Whitmore Road and then east to Brookdale Road. Brookdale Road is a two-lane surfaced road that accesses private parcels along that road. The privately owned unpaved project site access road is approximately 2.0 miles from the Brookdale Road / Whitmore Road intersection.

The project area is relatively rural and most of the roads, including the project site access road are commonly used for large farm equipment and heavy duty vehicles for agricultural operations. Vehicle and heavy machinery access to the project area would occur on existing roads and, to the extent possible, existing parking areas on the private unpaved project access road would be employed for equipment staging. No new road construction (or maintenance to existing roads) is planned in conjunction with the project, other than the temporary design considerations for the low water crossings on the private site access roads.

Project traffic would arrive on Old Highway 44 drive after traveling through the more highly used and urbanized SR 44 highway that provides regional access through the area. Delivery of heavy equipment and construction employee traffic would occur during approximately four 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 are as follows:

<u>Vehicle Trips</u>

- 165 rock haul truck trips (20-ton-loads)
- 6 large flatbed trailer trips (to bring equipment to / from the site)
- 15 large flatbed truck trips (to bring supplies to the site)
- 125 dump truck trips (to bring gravel to the site for temporary crossings)

<u>Equipment</u>

- Large front-end loader
- Large flatbed truck
- Large flatbed trailer
- Large excavators
- Haul trucks
- Dump trucks (eight-yard-capacity)
- Truck cranes
- Concrete pump trucks

3.16.2 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 site review of existing conditions.

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

a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections);

b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways;

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);

e) Result in inadequate emergency access;

f) Result in inadequate parking capacity; or

g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

No Action Alternative

Under this alternative, no direct transportation / traffic effects would occur. No changes in traffic volumes or patterns would occur. No increases in hazards or needs for emergency access or parking would occur.

Proposed Action Alternative

Under this alternative, project construction activities would require truck and worker trips on SR 44, Old Highway 44, Whitmore Road, Brookdale Road and the privately owned dirt haul roads to access the project site. The proposed project would increase vehicle trips and type of equipment transported on these routes. Project activities would increase traffic levels on a total of approximately 2.9 miles of paved public roads and approximately 1.6 miles of unpaved private roads from SR 44. Construction equipment (i.e. large trucks and excavators) would be mobilized to the site prior to project activities and would be demobilized upon completion of these activities.

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. Post-construction activities (i.e. revegetation, maintenance and monitoring) would require intermittent access for approximately two to three years.

Existing traffic volumes along SR 44 are high and moderate respectively and the potential increase in traffic generated from construction would be localized and minimal. There are consistent daily traffic volumes in the area of the project site due to the rural residential and agricultural uses.

SR 44 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 on SR 44. 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. 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. Project-related impacts to traffic loads and capacity of the road systems are considered less than significant.

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 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.

Project activities would not result in a change in air traffic patterns, nor would they substantially result in safety risks or increase hazards due to design features, or incompatible uses. Emergency access and parking capacity would not change as a result of project activities. The project activities also do not conflict with any Tehama County transportation plans or any other alternative transportation plans. As a result of the proposed project, there would be less than significant impacts on transportation.

4.0 Consultation and Coordination

4.1 Tribes, Agencies, and Organizations Contacted or Consulted

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

4.2 Public Comments

An initial public scoping notice was published in the legal section of the Redding Record Searchlight on March 28, 2013, requesting comments by April 19, 2013. No comments were received. A public Notice of Intent to approve a MND was published in the legal section of the Redding Record Searchlight on September 1, 2015. The Draft EA / IS and FONSI / MND was released for public review from September 1, 2015 to September 30, 2015. Appendix I includes copies of all of the comments received. Appendix J includes responses to the comments received.

5.0 Compliance with Environmental Laws and Regulations

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

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	Central Valley Regional Water Quality Control Board
Clean Air Act	Shasta County Air Quality Management District
Clean Water Act Section 401	Central Valley Regional Water Quality Control Board
Clean Water Act Section 402	State Water Resources Control Board
Clean Water Act Section 404	U.S. Army Corps of Engineers
Endangered Species Act	National Marine Fisheries Service U.S. Fish and Wildlife Service
Fish and Wildlife Coordination Act	U.S. Fish and Wildlife Service California Department of Fish and Wildlife National Marine Fisheries 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	California Office of Historic Preservation
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

The following individuals prepared, or participated in the preparation of this document:

Federal Agencies:

Natural Resource Conservation Service

Alicia Danielle-Young Herrera, Partner Biologist

U.S. Fish and Wildlife Service

Dan Meier, Program Manager, Anadromous Fish Screen Program
Brenda Olson, Habitat Restoration Coordinator, Anadromous Fish Restoration Program
Sheli Wingo, Program Coordinator, Partners for Fish & Wildlife Program

State Agencies:

California Department of Fish and Wildlife

Patricia Bratcher, Habitat Restoration Coordinator / Senior Environmental Scientist (Specialist)
Eda Eggeman Ebe, Environmental Scientist
Michael Harris, Senior Environmental Scientist (Supervisor)
Brad Henderson, Senior Environmental Scientist (Specialist)

California Department of Water Resources

Teresa Connor, Supervising Engineer, Water Resources
Nancy Snodgrass, Engineer, Water Resources

Technical Consultants:

Tehama Environmental Solutions, Inc.

Jeff Souza, Senior Biologist
Kelly Peterson, Associate Environmental Specialist
Aaron Souza, Senior Planner
Ben Myhre, Associate Biologist

Northwest Hydraulic Consultants Inc.

Brad Hall, Principal
Jenna Paul, Junior Engineer
Travis Shinkle, Senior Engineering Technician
Brian Wardman, Senior Engineer

SAGE Engineers, Inc.

Travis Koch, P.E., Senior Project Engineer
Tom Sell, P.E., Principal Engineer

Dittes and Guardino Consulting

John Dittes, Senior Botanist

Josephine Guardino, Botanist

Western Shasta Resource Conservation District

Shiloe Braxton, Project Manager
Leslie Bryan, Watershed / Climate Stewardship Coordinator / Project Manager
David DeMar, Archaeologist
Maureen Teubert, Project Manager

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Persons Consulted

Ms. Patricia Bratcher, Habitat Restoration Coordinator, California Department of Fish and Wildlife, Region 1, Redding, California.

Mr. Dale J. Fletcher, Building Official, Shasta County, Department of Resource Management, Building Division Redding, California.

Mr. Jason Hanni, Senior Biologist, U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, Sacramento, California.

Mr. Matt Johnson, Environmental Scientist, California Department of Fish and Wildlife, Region 1, Redding, California.

Mr. Ken Rood, Principal, Northwest Hydraulic Consultants, Sacramento, California.

Mr. Bill Walker, Interim Planning Division Manager, Shasta County Department of Resource Management, Planning Division, Redding, California.

Mr. Brian Wardman, P.E., Senior Engineer, Northwest Hydraulic Consultants, Sacramento, California.

Mr. Brent Wolfe, Principal, Northwest Hydraulic Consultants, Sacramento, California.

Ms. Alicia Danielle-Young Herrera, Rangeland Watershed Initiative Partner Biologist, Point Blue / Natural Resource Conservation Service, Redding, California.