REVISED
Delineation of Waters of the U.S.
Deer Creek DCID Dam Fish Passage Project
(SPK-2016-00162)

Tehama County, California

January 2019

Prepared for:

nhc
northwest hydraulic consultants
2600 Capitol Avenue, Suite 140
Sacramento, CA 95816

Prepared by:

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

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INTRODUCTION

This Revised Delineation of Waters of the U.S. (delineation) was conducted for Northwest Hydraulic Consultants (NHC) by Tehama Environmental Solutions, Inc. (TES) for the Deer Creek Irrigation District (DCID) Dam Fish Passage Project (project). The Revised delineation was conducted to incorporate an expansion of the original study area due to a road realignment necessary to avoid sensitive cultural resources. TES was retained by NHC under subcontract to prepare this delineation for the U.S. Fish and Wildlife Service (USFWS).

The purpose of this delineation is to identify and quantify "Waters of the United States" that may fall within the jurisdiction of the United States Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act. This report follows the *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports* (United States Army Corps of Engineers 2016a) and the *Updated Map and Drawing Standards for the South Pacific Division Regulatory Program* (United States Army Corps of Engineers 2016b). This delineation should be considered preliminary until the results are reviewed and verified by the Corps.

Study Area Location and Directions

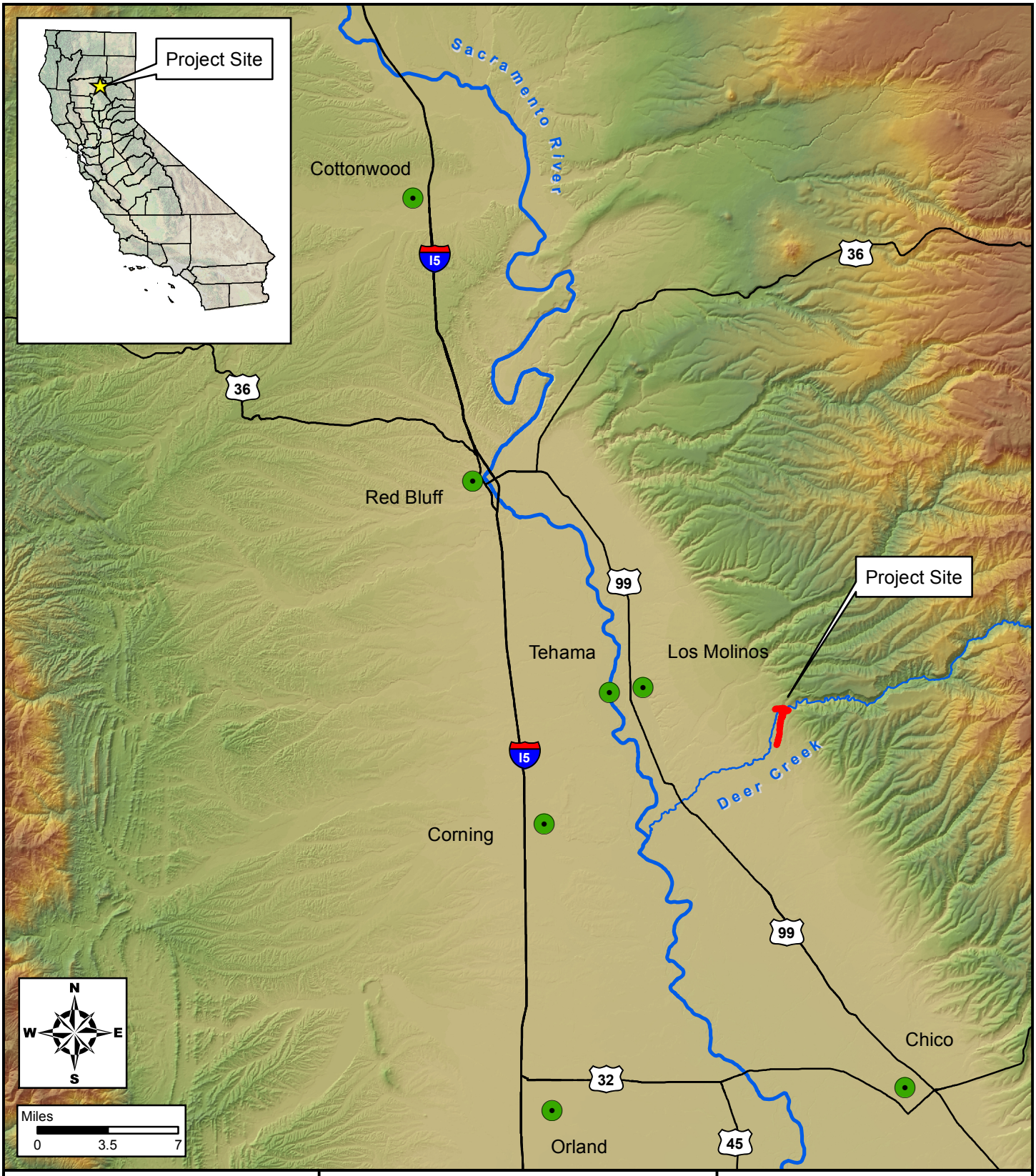
The study area is located on Deer Creek, at approximately 11 river miles upstream of the confluence with the Sacramento River, east of Vina, Tehama County, California (Figure 1). Specifically, the study area for the project is located in Sections 22, 23, and 27, Township 25 North, Range 1 West Mount Diablo Base and Meridian (MDBM); within the 7.5-minute United States Geological Survey Acorn Hollow quadrangle map (Figure 2).

To access the site from Interstate 5 at Red Bluff, travel east on Antelope Boulevard for 2.5 miles, and continue on California Highway 99-S for 19 miles. Turn east on Vina Road and travel 2.0 miles, then turn left on Leininger Road. Continue on Leininger Road for 0.5 miles. Turn right on Reed Orchard Road and travel for approximately 4 miles. Continue on an unnamed ranch road for approximately 2.0 miles to a locked gate, west of the DCID. The dam access is located on private property and permission from the landowner is required for access. Access the north side of the study area by staying on Leininger Road past Reed Orchard Road for about 1.5 miles where the road turns into Rock Quarry Road. Continue traveling about 4.5 miles to a locked gate. Permission to access the private land on the north side of the DCID is also required.

Proposed Project

The proposed project is designed to increase upstream and downstream passage at the diversion dam for adult and juvenile salmonids and lamprey, while meeting DCID's irrigation needs. In addition, the project intends to improve and maintain efficiency of the agricultural irrigation diversion.

The proposed project involves constructing a roughened channel (rock ramp) spanning the entire width of the creek downstream of the existing dam. In addition, the project will lower approximately 1,250 feet of the existing diversion ditch, and replace the off-channel fish screen and juvenile bypass pipe at a lower elevation. The project is being implemented by Trout Unlimited in cooperation with the private landowners, and the DCID Fish Passage Restoration Project Technical Team, which includes representatives from the USFWS, National Marine Fisheries Service, California Department of Fish and Wildlife, Central Valley Regional Water Quality Control Board (RWQCB), DCID, and several private consulting firms. The final engineering designs authored by NHC are dated September, 2017.



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ENVIRONMENTAL SOLUTIONS, INC.

910 Main Street, Suite D, Red Bluff, CA 96080
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FIGURE 1

Site Vicinity Map

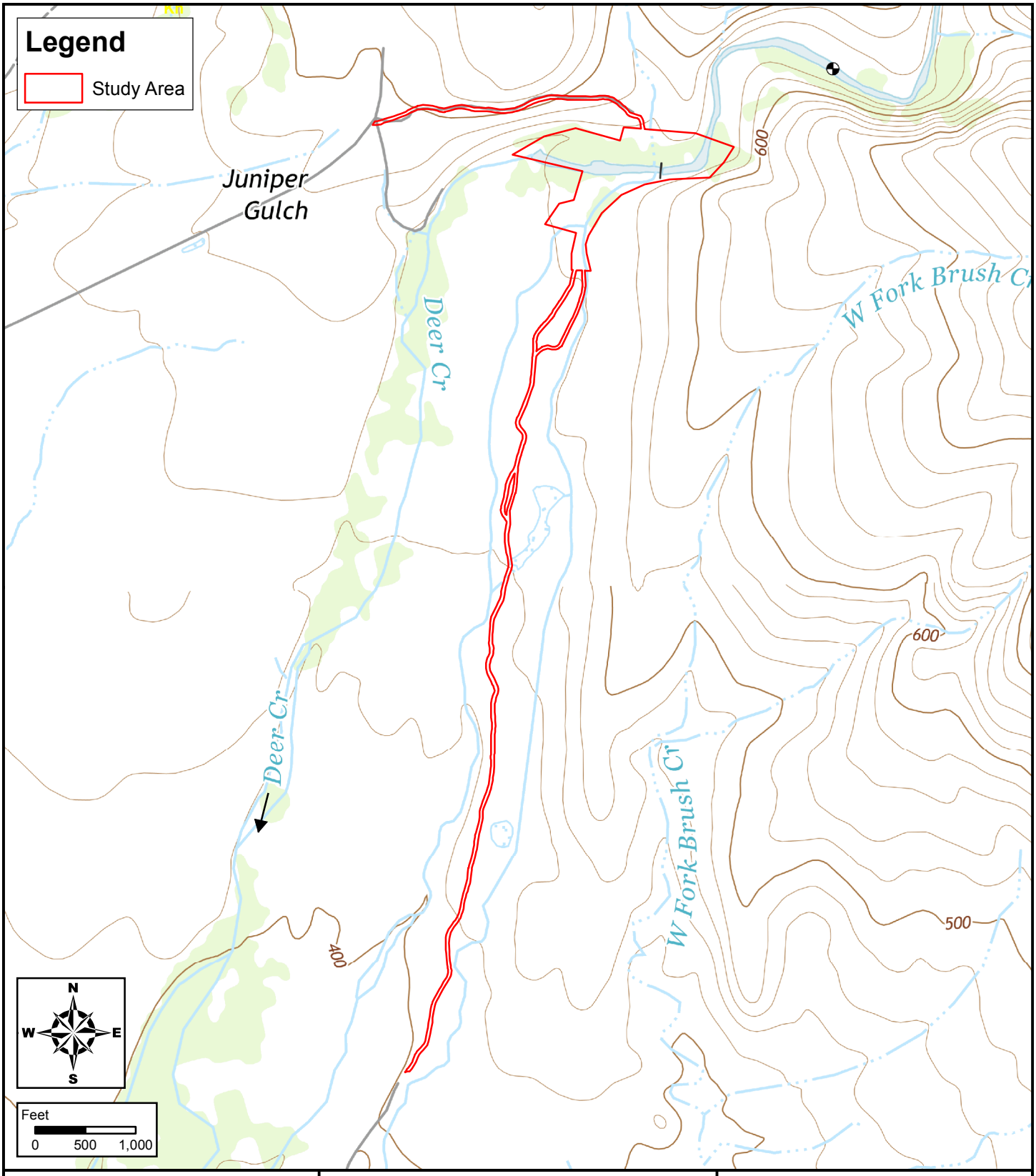

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FIGURE 2

Site Location Map

SOURCE: USGS, 7.5 Minute, California-Tehama Co., ACORN HOLLOW QUADRANGLE

Contact Information

Project Applicant

U.S. Fish and Wildlife Service
Ms. Patricia Parker Hamelberg, Fish Biologist / Habitat Restoration Coordinator
Red Bluff Fish and Wildlife Office
10950 Tyler Road
Red Bluff, California 96080
(530) 527-3043, ext. 248
Tricia_Parker@fws.gov

Property Owners

Deer Creek Irrigation District
Mr. John Edson, President
Vina, California

Deer Creek Vina Ranch
Mr. James Gaumer, Managing Partner
Chico, California

Leininger Ranch
Mr. Todd Leininger, Landowner
Vina, California

ENVIRONMENTAL SETTING

General Site Characteristics

The study area is located at the base of the foothills of the southernmost extent of the Cascade Range in Tehama County. The terrain is generally gradually sloping with steep slopes and varying aspects associated with a perennial creek, which is the main drainage. The site has a general western aspect and drains to the southwest. The elevation of the study area ranges from approximately 400 feet above sea level at the southern project boundary to approximately 575 feet at the northern access road.

Land Use

The study area is primarily used for livestock grazing and agricultural irrigation diversion. Additional uses in the general area include rock harvest and open space.

Hydrology

Deer Creek is an approximately 60-mile-long perennial stream flowing generally southwest, originating from the southern-facing slopes of Mount Lassen and eventually flowing into the Sacramento River near river mile 219.5, in the vicinity of Vina, California. The watershed includes a total area of 229 square miles which drains from northeast to southwest. Below the DCID dam, the creek flows for approximately eleven miles before reaching the Sacramento River.

The DCID diversion has an appropriative water right for 36 cubic feet per second (cfs) and is the main hydrologic feature in the study area (Northwest Hydraulic Consultants 2017). Water from the DCID diversion is conveyed through a constructed canal equipped with a fish screen. A bypass return pipe allows any fish entrapped in the canal to return to Deer Creek downstream. Diverted water that is passed through the screen is conveyed through a series of ditches to deliver irrigation and stock water to a number of DCID customers. In addition, an ephemeral stream feeds in to Deer Creek near the north access road. Small seasonal wetlands occur along the south access road to the study area.

Soils

Ten different soil map units occur within the study area (Figure 3) according to the local soil survey (U.S. Department of Agriculture [USDA] – Soil Conservation Service et al. 1967). The ten identified map units are listed below:

Anita cobbly clay (An)
These soils are located in small basins and in seep areas on high terraces east of the Sacramento River. Anita soils are formed in alluvium derived from volcanic rocks such as basalt and andesite. The soils are imperfectly-drained, with very slow runoff and permeability. The soils generally have a hardpan or cemented layer at a depth of one to five feet. The taxonomy of the series is fine, montmorillonitic, thermic, Typic Durochrepts (Natural Resources Conservation Service 2018).

Keefers loam, 0 to 3 percent slopes (Kf)
These soils are located on the eastern side of the Sacramento River on low terraces. They are formed on old alluvium, derived from basic igneous rock, mainly andesite and basalt, except along cracks. The soil is well-drained and permeability and runoff are both slow. Roots and water are restricted due to the clay subsoil at a depth that ranges from three feet to six feet or more. The taxonomy of the map unit is clayey-skeletal, montmorillonitic, thermic, Mollic Haploxeralfs (Natural Resources Conservation Service 2018).

Millrace gravelly fine sandy loam, 0 to 3 percent slopes (Mp)
These soils are located east of the Sacramento River on narrow floodplains. They are formed in alluvium derived from basic volcanic rock. These soils are somewhat excessively-drained with very rapid permeability and very slow runoff. The taxonomy of the map unit is loamy-skeletal, mixed, thermic Pachic Haploxerolls (Natural Resources Conservation Service 2018).

Molinos fine sandy loam (My)
These soils are located along active streams east of the Sacramento River and are formed from recent alluvium derived from basic igneous rocks, mainly andesite and basalt. These soils consist of well-drained to somewhat excessively drained soils with moderately rapid permeability and very slow runoff. The taxonomy of the series is coarse-loamy, mixed, superactive, thermic Cumulic Haploxerolls (Natural Resources Conservation Service 2018).

Molinos complex, channeled (Mzt)
These soils are located along active streams east of the Sacramento River and are formed in recent alluvium derived from basic igneous rocks, mainly andesite and basalt. This complex consists of variable proportions of any of the Molinos soils. This soil is well-drained to somewhat excessively-drained and permeability varies based on the map units present in the complex. The taxonomy of the map unit is coarse-loamy, mixed, nonacid, thermic, Aquic Xerofluvents (A. Conlin pers. comm. 2017).

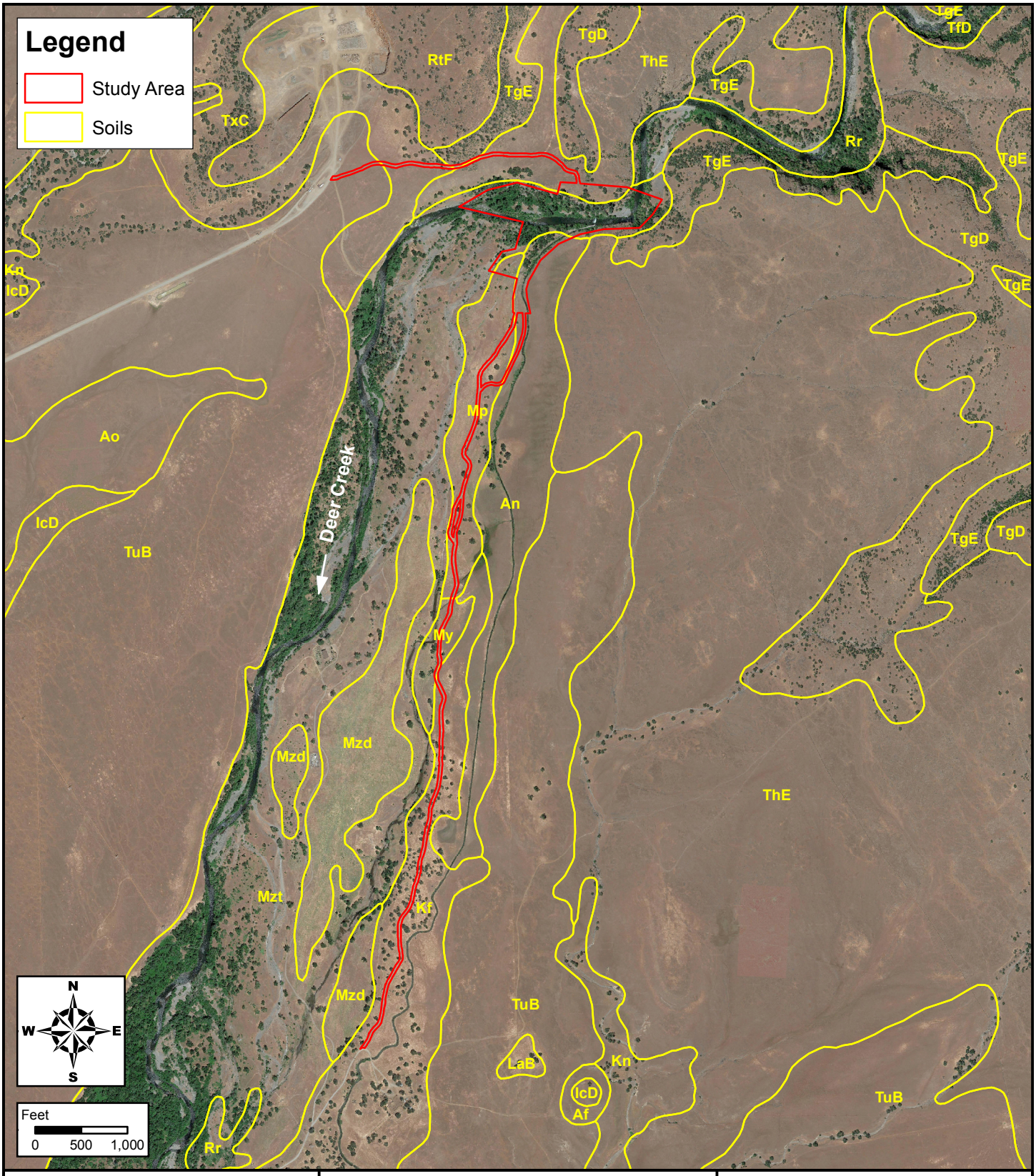

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FIGURE 3

Soil Survey Map

DATA SOURCE: USDA Natural Resources Conservation Service, September, 2017

PHOTO SOURCE: Google Earth, 5/25/2017

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

Toomes extremely rocky loam, 1 to 50 percent slopes (ThE)
These soils are located east of the Sacramento River, formed in material derived from volcanic rock. They are well-drained with moderate permeability and medium runoff. The taxonomy of the map unit is lithic, loamy, mixed, thermic, Ruptic-Xerorthentic Xerochrepts (Natural Resources Conservation Service 2018).

Toomes very rocky loam, 30 to 50 percent slopes (TgE)
These soils are located east of the Sacramento River, formed in material derived from volcanic rock. Hard volcanic breccia exists at a shallow depth and is impervious to roots and water. These soils are well-drained with moderate permeability and medium runoff. The taxonomy of the map unit is lithic, loamy, mixed, thermic, Ruptic-Xerorthentic Xerochrepts (Natural Resources Conservation Service 2018).

Tuscan cobbly loam, 1 to 5 percent slopes (TuB)
These soils are located on the upper terraces east of the Sacramento River and formed from old alluvium washed from areas of volcanic rock. The soil is well-drained with very slow permeability and slow runoff. The subsoil is underlain by a hardpan which is impervious to roots and water, located at 10 to 20 inches in depth. The taxonomy of the map unit is fine, montmorillonitic, thermic, Typic Durixeralfs (Natural Resources Conservation Service 2018).

Tuscan very stoney loam, 3 to 15 percent slopes (TxC)
This series is located on the tops of old gently sloping terraces east of the Sacramento River. The soils are formed from old alluvium washed from areas of volcanic rock. The soil is well-drained with very slow permeability and slow runoff. The taxonomy of the map unit is fine, montmorillonitic, thermic, Typic Durixeralfs (Natural Resources Conservation Service 2018).

Vegetation / Plant Communities

Six habitat types generally occur within the study area as defined by the California Wildlife-Habitat Relationships classification system (Mayer and Laudenslayer 1988). The habitat types include: Valley Foothill Riparian, Annual Grassland, Blue Oak Woodland, Valley Oak Woodland, Barren and Riverine.

Annual Grassland
Annual grassland habitat is located primarily along the access routes. Dominant herbaceous species here include native and non-native annual grasses and forbs such as wild oats *(Avena fatua)*, ripgut brome *(Bromus diandrus)*, medusahead *(Taeniatherum caput-medusae)*, fillaree *(Erodium sp.)*, and foxtail fescue *(Festuca myuros)*. Scattered blue oak *(Quercus douglasii)* are present in some areas.

Barren
Areas of barren habitat exist where the creek has scoured away the vegetation during high flow events. These areas are characterized by the lack of, or sparse vegetation, and gravel and cobble composition associated with periodic stream deposits.

Blue Oak Woodland
Blue oak woodland occurs in small patches amongst the annual grassland habitat. The dominant woody plant species is blue oak with valley oak *(Quercus lobata)*, gray pine *(Pinus sabiniana)*, and interior live oak *(Quercus wislizenii)* as subdominants in some areas. There is no shrub layer for the majority of blue

oak woodland, however buckbrush *(Ceanothus cuneatus)* and western juniper *(Juniperis occidentalis)* are present in areas.

Riverine

Riverine habitat is present within the channel of Deer Creek. The creek channel is primarily devoid of vegetation, but the exposed barren rock and gravel along both banks of the stream support woody and herbaceous species such as willows *(Salix spp.)*, white alder *(Alnus rhombifolia)*, buttonbush *(Cephalanthus occidentalis),* deer grass *(Muhlenburgia rigens)* and torrent sedge *(Carex nudata)*.

Valley Foothill Riparian

Valley foothill riparian habitat occurs on both banks and floodplains within the study area. The dominant woody plant species include Fremont cottonwood *(Populus fremontii)*, valley oak and California sycamore *(Platanus racemosa)*. Additional species include Oregon ash *(Fraxinus latifolia)*, white alder, narrow-leaved willow *(Salix exigua),* arroyo willow *(Salix lasiolepis)*, mulefat *(Baccharis salicifolia)*, fig *(Ficus carica)*, California grape *(Vitis californica)*, California blackberry *(Rubus ursinus)* and Himalayan blackberry *(Rubus armeniacus)*. Blue elderberry *(Sambucus mexicana)* shrubs are also found on, and near the south bank, downstream of the dam. The sparse herbaceous layer includes native species such as deer grass, horsetail *(Equisetum sp.)* and mugwort *(Artemisia douglasiana)*, along with other native and non-native grasses and forbs.

Valley Oak Woodland

Valley oak woodland habitat occurs in the southern portion of the study area along the irrigation ditch. The woodland is dominated by valley oak. Woody subdominants include California sycamore, hoary coffeeberry *(Rhamnus tomentella ssp. tomentella)* and blue elderberry. Native and non-native grasses and forbs dominate the ground cover.

METHODS

A delineation of waters of the U.S. was conducted within the study area on May 9, 11, 16, 18 and 23, 2018, June 19 and 22, 2018 and December 19, 2018 by Mr. Jeff Souza, TES Principal Biologist, Ms. Lorin Mills, TES Environmental Scientist, and Mr. John Dittes, Senior Botanist with Dittes and Guardino Consulting. The delineation of wetlands was conducted in accordance with the *1987 Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (U.S. Army Corps of Engineers 2008) using a Routine Determination Method. Five data points were characterized to determine the presence or absence of the three wetland parameters (vegetation, soils and hydrology). The data forms for the five data points are included in Appendix A. The wetland indicator status of plant species was based on the *Arid West 2016 Regional Wetland Plant List* (Lichvar et al. 2016). Soil colors were determined using the *Munsell Soil Color Charts* (Munsell Color 2000). The boundaries of other waters of the U.S. were delineated based on the observed Ordinary High Water Mark (OHWM) using the methods outlined in *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008), the Updated Datasheet for *the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Curtis and Lichvar 2010) and / or *Regulatory Guidance Letter No. 05-05* (U.S. Army Corps of Engineers 2005). Data forms for the identification of the OHWM for ephemeral and intermittent streams are included in Appendix B.

Once delineated, the boundaries of all identified wetlands and other waters of the U.S. were then marked in the field with pin flags or field flagging, along with the location of all data points. The boundaries of all identified wetlands and other waters, and the locations of all data points, were then mapped using a

Trimble GeoExplorer 6000 series Global Positioning System (GPS) unit, capable of sub-meter accuracy. All area features less than two meters in width / diameter were collected as points or lines. Point features were physically measured to determine area data, while line features were assigned an average width and multiplied by the GPS-measured distance. These features and measurements are shown in Figure 4.

RESULTS

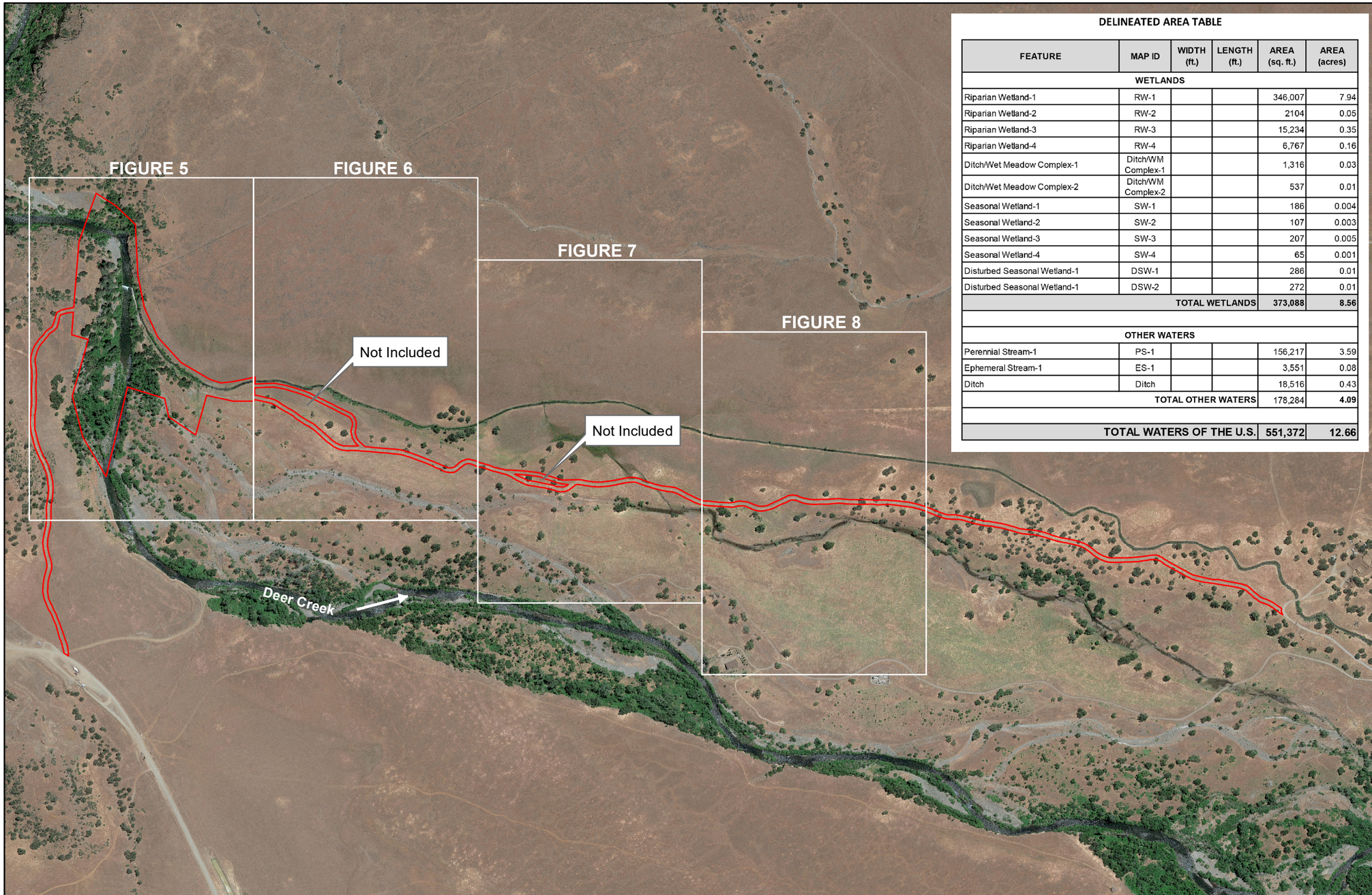
Based on the presence / absence of indicators of wetland hydrology, hydrophytic vegetation and hydric soils, 8.56 acres of potentially jurisdictional wetlands were identified. Based on the presence of an OHWM, 4.09 acres of potentially jurisdictional other waters of the U.S. were also identified and delineated. Table 1 presents a summary of the total acreage of the jurisdictional waters of the U.S. The classification of wetland communities is based primarily on the descriptions found in *Common Wetland Plants of Central California* (Fiedler 1996). Site photos of the delineated waters and associated data points are included as Appendix C.

The vegetation in the Riparian Wetland (RW) features (Figure 5) varies by location within the study area. On the floodplains, the woody dominants include Fremont cottonwood [FACW], California sycamore [FAC], valley oak [FAC] and California grape [FACU]. On the perennial stream and side channel margins, the woody dominants include white alder [FACW], black willow *(Salix gooddingii)* [FACW], narrow-leaved willow [FACW], arroyo willow [FACW] and buttonbush [OBL]. The dominant woody vine species include, California pipevine *(Aristolochia californica)* [NL] and Himalayan blackberry [FAC]. Native herbaceous dominants include rice cutgrass *(Leersia oryzoides)* [OBL], mugwort [FAC] and deergrass [FAC].

The Seasonal Wetland (SW) features (Figures 5, 6, 7, and 8) tend to be dominated by ryegrass *(Festuca perennis)* [FAC] and Mediterranian barley *(Hordeum marinum ssp. gussoneanum)* [FAC]. Common subdominants include annual hair grass *(Deschampsia donthonioides)* [FACW], popcornflower *(Plagiobothrys stipitatus)* [FACW], cut-leaved plantain *(Plantago coronopus)* [FAC] and toad rush *(Juncus bufonius)* [FACW]. A number of these features are located, or partially located within the southern access road where they are devoid of vegetation. These features are classified as Disturbed Seasonal Wetlands (DSW).

The margins of the Ditch feature (Figure 5) are dominated by arroyo willow [FACW], white alder [FACW] and deergrass [FAC]. Routine maintenance of the ditch and vegetation is evident.

The Ditch / Wetland Complex (Ditch / WC) features (Figure 7) are dominated by pale spikerush *(Eleocharis macrostachya)* [OBL], hawkbit *(Leontodon saxatilis)* [FACU], hyssop loosestrife *(Lythrum hyssopifolia)* [OBL] and ryegrass [FAC]. The wetter edges of the complex are dominated by seep monkeyflower *(Mimulus guttatus)* [OBL], Dallisgrass *(Paspalum dilatatum)* [FAC], low mannagrass *(Glyceria declinata)* [FACW], sticktight *(Bidens frondosa)* [FACW] and variegated clover *(Trifolium variegatum)* [FAC].



DELINEATED AREA TABLE

FEATURE	MAP ID	WIDTH (ft.)	LENGTH (ft.)	AREA (sq. ft.)	AREA (acres)
WETLANDS					
Riparian Wetland-1	RW-1			346,007	7.94
Riparian Wetland-2	RW-2			2104	0.05
Riparian Wetland-3	RW-3			15,234	0.35
Riparian Wetland-4	RW-4			6,767	0.16
Ditch/Wet Meadow Complex-1	Ditch/WM Complex-1			1,316	0.03
Ditch/Wet Meadow Complex-2	Ditch/WM Complex-2			537	0.01
Seasonal Wetland-1	SW-1			186	0.004
Seasonal Wetland-2	SW-2			107	0.003
Seasonal Wetland-3	SW-3			207	0.005
Seasonal Wetland-4	SW-4			65	0.001
Disturbed Seasonal Wetland-1	DSW-1			286	0.01
Disturbed Seasonal Wetland-1	DSW-2			272	0.01
			TOTAL WETLANDS	**373,088**	**8.56**
OTHER WATERS					
Perennial Stream-1	PS-1			156,217	3.59
Ephemeral Stream-1	ES-1			3,551	0.08
Ditch	Ditch			18,516	0.43
			TOTAL OTHER WATERS	178,284	**4.09**
			TOTAL WATERS OF THE U.S.	**551,372**	**12.66**

Legend

Study Area (35.94 Acres)

FIGURE 4

Revised Delineation Map
Overview

DELINEATION

Jeff Souza
Lorin Mills
Tehama Environmental Solutions, Inc.

John Dittes
Dittes and Guardino Consulting

CLIENT

nhc northwest hydraulic consultants

2600 Capitol Ave. Suite 140
Sacramento, CA 95816

TEHAMA ENVIRONMENTAL SOLUTIONS, INC.

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N E S W

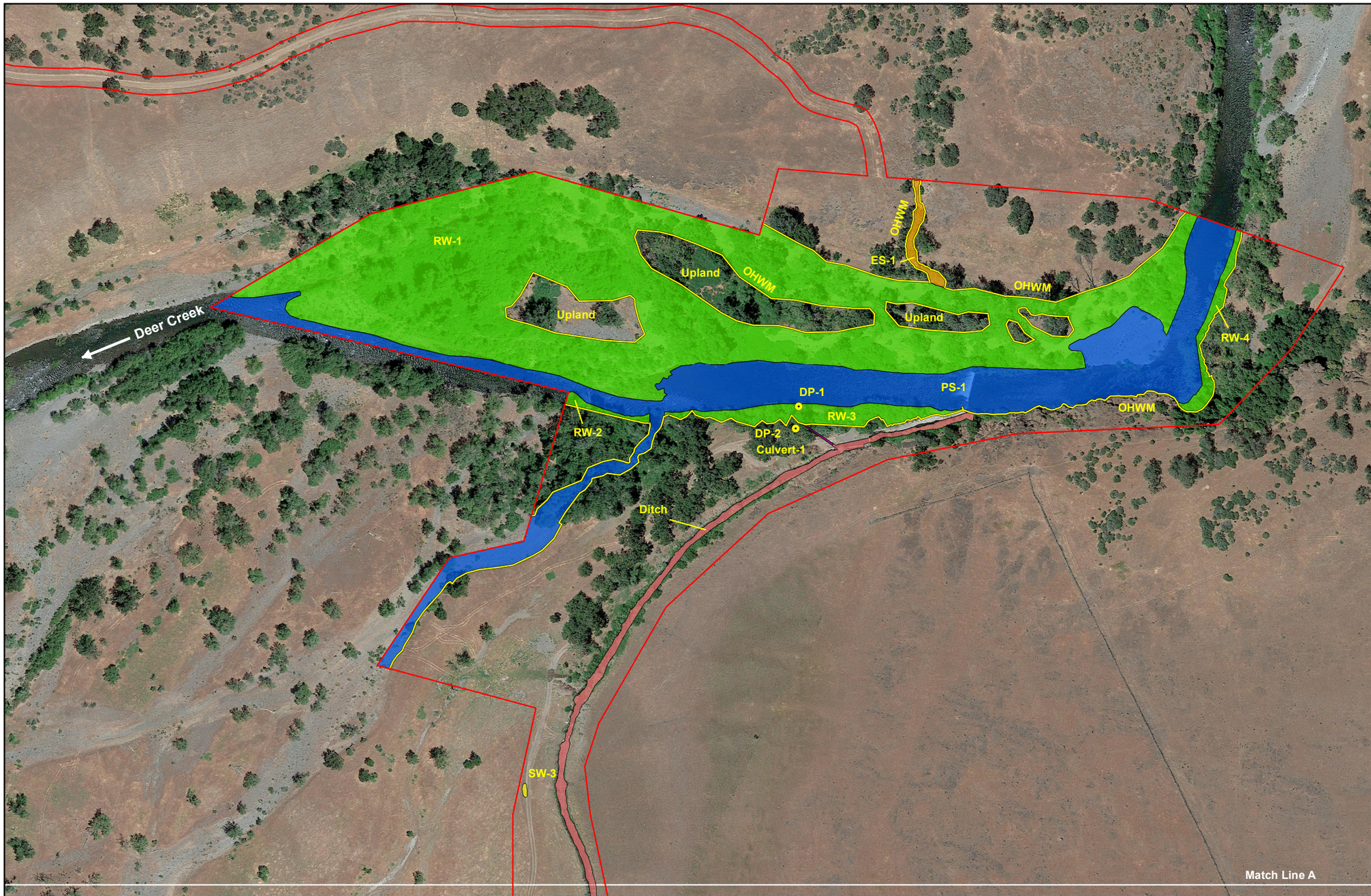
SCALE

Feet
0 800 1,600
1 in = 800 ft (11" X 17" paper)

January 2019

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

PHOTO SOURCE: Google Earth, 5/25/2017



Legend

- Study Area (35.95 Acres)
- Perennial Stream
- Riparian Wetland
- Ephemeral Stream
- Ditch
- Ditch / Wet Meadow Complex
- Culvert
- Disturbed Seasonal Wetland
- Seasonal Wetland
- Ordinary High Water Mark (OHWM)
- Data Point (DP-1)

FIGURE 5

Revised Delineation Map

DELINEATION

Jeff Souza
Lorin Mills
Tehama Environmental Solutions, Inc.

John Dittes
Dittes and Guardino Consulting

CLIENT

nhc northwest hydraulic consultants

2600 Capitol Ave. Suite 140
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N W E S

SCALE

Feet

0 250 500

1 in = 200 ft (11" X 17" paper)

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PHOTO SOURCE: Google Earth, 5/25/2017

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FIGURE 6

Revised Delineation Map

DELINEATION

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Lorin Mills
Tehama Environmental Solutions, Inc.

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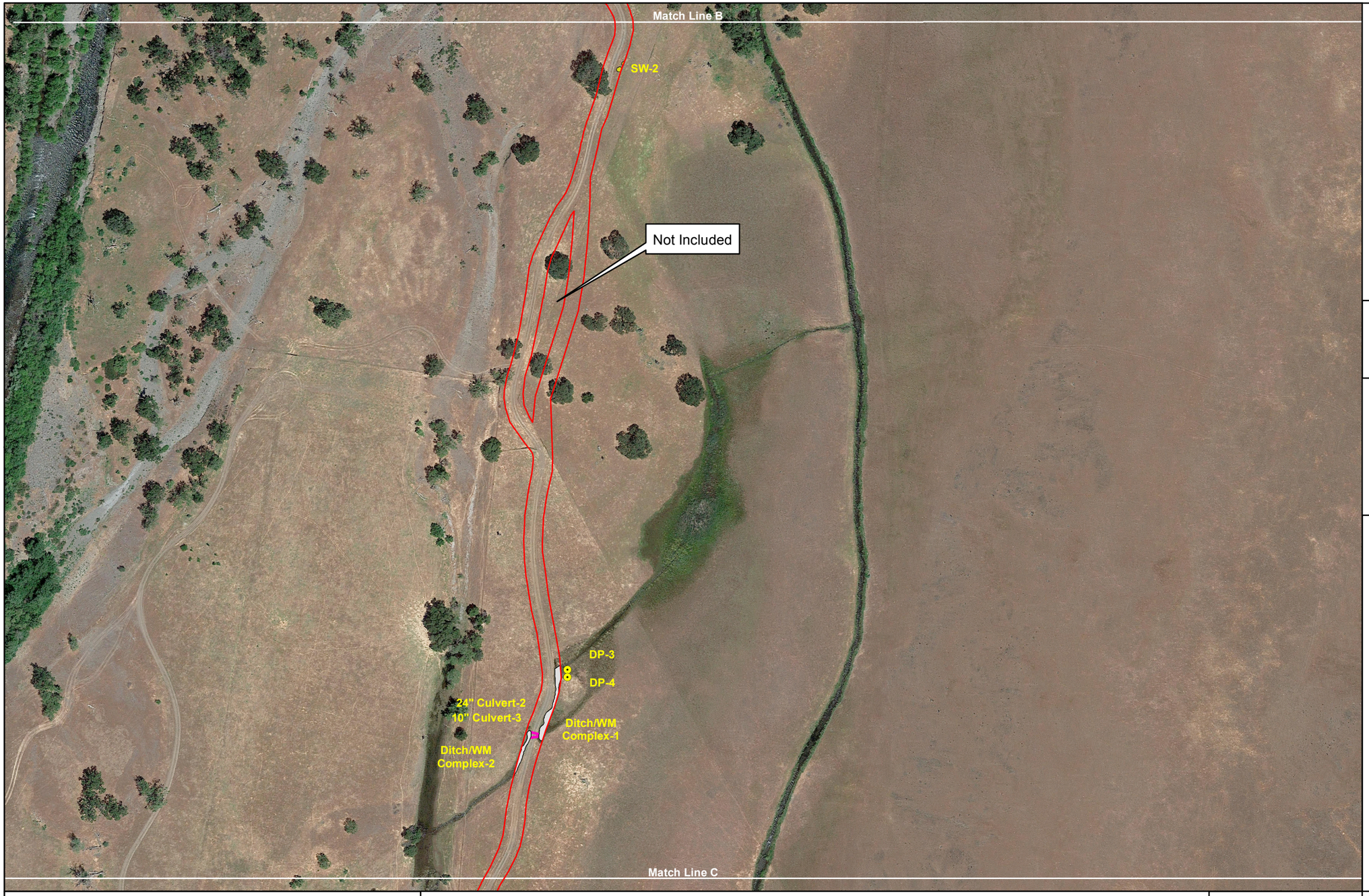

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- Disturbed Seasonal Wetland
- Seasonal Wetland
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FIGURE 7

Revised Delineation Map

DELINEATION

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Lorin Mills
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PHOTO SOURCE: Google Earth, 5/25/2017

Legend

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- Ditch / Wet Meadow Complex
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- Disturbed Seasonal Wetland
- Seasonal Wetland
- Ordinary High Water Mark (OHWM)
- Data Point (DP-1)

FIGURE 8

Revised Delineation Map

DELINEATION

Jeff Souza
Lorin Mills
Tehama Environmental Solutions, Inc.

John Dittes
Dittes and Guardino Consulting

CLIENT

nhc northwest hydraulic consultants

2600 Capitol Ave. Suite 140
Sacramento, CA 95816

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

Delineation of Waters of the U.S.

Deer Creek DCID Dam Fish Passage Project

Tehama County, California

N W E S

SCALE

Feet

0 250 500

1 in = 200 ft (11" X 17" paper)

January 2019

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

PHOTO SOURCE: Google Earth, 5/25/2017

TABLE 1 SUMMARY OF PRELIMINARY DELINEATED WATERS OF THE U.S. Deer Creek DCID Dam Fish Passage Project			
Wetlands	**Coordinates**		**Total Acreage**
	Lat.	**Long.**	
Riparian Wetland-1	40° 00' 42.33" N	-121° 57' 22.84" W	7.94
Riparian Wetland-2	40° 00' 40.44" N	-121° 57' 25.65" W	0.05
Riparian Wetland-3	40° 00' 40.26" N	-121° 57' 19.41" W	0.35
Riparian Wetland-4	40° 00' 43.25" N	-121° 57' 09.35" W	0.16
Ditch/Wet Meadow Complex-1	40° 00' 01.72" N	-121° 57' 35.79" W	0.03
Ditch/Wet Meadow Complex-2	40° 00' 00.80" N	-121° 57' 36.60" W	0.01
Seasonal Wetland-1	39° 59' 46.21" N	-121° 57' 38.08" W	0.004
Seasonal Wetland-2	40° 00' 14.03" N	-121° 57' 33.98" W	0.003
Seasonal Wetland-3	40° 00' 33.23" N	-121° 57' 27.27" W	0.005
Seasonal Wetland-4	40° 00' 15.99" N	-121° 57' 34.42" W	0.002
Disturbed Seasonal Wetland-1	40° 00' 23.54" N	-121° 57' 32.35" W	0.01
Disturbed Seasonal Wetland-2	40° 00' 15.82" N	-121° 57' 34.52" W	0.01
Total Wetlands			**8.56**
Other Waters			**Total Acreage**
Perennial Stream-1	40° 00' 42.33" N	121° 57' 21.65" W	3.59
Ephemeral Stream-1	40° 00' 42.33" N	121° 57' 17.30" W	0.08
Ditch	40° 00' 42.33" N	121° 57' 21.76" W	0.43
Total Other Waters			**4.09**
TOTAL WATERS OF THE U.S.			**12.66**

Jurisdictional Considerations

The Perennial Stream feature PS-1 and the Ephemeral Stream feature ES-1 (Figure 5) appear to be jurisdictional as they meet the definition of paragraph (a)(5) "tributaries" to a Traditional Navigable Water (Sacramento River) as defined by the *Clean Water Rule: Definition of "Waters of the United States"* (Clean Water Rule) (U.S. Army Corps of Engineers and Environmental Protection Agency 2015). The Riparian Wetland (RW) features associated with feature PS-1 are likely jurisdictional as they appear to meet the definition of paragraph (a)(6) "adjacent waters" as defined by the Clean Water Rule.

The Ditch feature (Figure 5) may, or may not be jurisdictional. It is connected at the upstream end to Deer Creek and it appears that some portion of the diverted water surface flows directly back to Deer Creek. However, the feature The Ditch / WM Complex features (Figure 7) may, or may not be jurisdictional due to the fact that the hydrology source is the Ditch feature system. Features SW-1, SW-2, SW-3, SW-4, DSW-1 and DSW-2 may, or may not be jurisdictional due to the fact that they do not appear to meet the definition of "adjacent waters" because they are not located within the 100-year floodplain as depicted on the *FEMA Flood Map Service* (Federal Emergency Management Agency 2018).

REFERENCES

Curtis, K.E. and R.L. Lichvar. 2010. *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States.* ERDC / CRREL TN-10-1. U.S. Army Corps of Engineer Research and Development Center, Cold Regions and Research Engineering Laboratory, Hanover, New Hampshire.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1, U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi.

Federal Emergency Management Agency. 2018. *FEMA Flood Map Service*. https://msc.fema.gov/portal/home. Accessed September 2018.

Fiedler, P.L. 1996. *Common Wetland Plants of Central California.* U.S. Army Corps of Engineers, Sacramento District.

Lichvar, R.W. and S.M. McColley. 2008. *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States.* U.S. Army Corps of Engineers, U.S. Army Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire.

Lichvar, R.W., D.L. Banks, W.N. Kirchner and N.C. Melvin. 2016. *The National Wetland Plant List: 2016 Wetland Ratings.* Phytoneuron 2016-30: 1-171. U.S. Army Corps of Engineers.

Mayer, K.E. and W.F. Laudenslayer, Jr., Editors. 1988. *A Guide to Wildlife Habitats of California*. California Department of Forestry and Fire Protection, Sacramento, California.

Munsell Color. 2000. *Munsell Soil Color Charts.* Grand Rapids, Michigan.

Natural Resources Conservation Service. 2018. *Web Soil Survey*. http://websoilsurvey.nrcs.usda.gov. Accessed June 2018.

Northwest Hydraulic Consultants. 2017. *Deer Creek DCID Dam Fish Passage Project 100% Basis of Design Report.* Prepared for the U.S. Fish and Wildlife Service, Red Bluff, California.

U.S. Army Corps of Engineers. 2005. *Ordinary High Water Mark Identification.* Regulatory Guidance Letter No. 05-05. December 7, 2005.

U.S. Army Corps of Engineers. 2008. *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Arid West Region (Version 2.0)*. ERDC/EL TR-08-28. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

U.S. Army Corps of Engineers. 2016a. *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports.* Regulatory Branch, Sacramento District. January 2016.

U.S. Army Corps of Engineers. 2016b. *Updated Map and Drawing Standards for the South Pacific Division Regulatory Program.* Special Public Notice. February 16, 2016.

U.S. Army Corps of Engineers and Environmental Protection Agency. 2015. *Clean Water Rule: Definition of "Waters of the United States"; Final Rule.* Federal Register Vol 80, No. 124. June 29, 2015.

U.S. Department of Agriculture, Soil Conservation Service and Forest Service in cooperation with University of California Agricultural Experiment Station. 1967. *Soil Survey Tehama County California.* U.S. Government Printing Office, Washington D.C.

PERSONS CONSULTED

Mr. Robert Chase, Regulatory Project Manager, U.S. Army Corps of Engineers, Sacramento District, Northern Section, Redding, California.

Mr. Andrew Conlin, Soil Scientist, Natural Resources Conservation Service, Pacific Soil Survey Region, Chico, California.

APPENDIX A

Routine Wetland Delineation Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: Deer Creek DCID Dam Fish Passage Project City/County: /Tehama Co. Sampling Date: 6/22/18

Applicant/Owner: USFWS / DCID State: CA Sampling Point: DP-1

Investigator(s): J. Souza / J. Dittes Section, Township, Range: Section 22, Township 25 North, Range 1 West MDBM

Landform (hillslope, terrace, etc.): stream bank Local relief (concave, convex, none): convex Slope (%): 15

Subregion (LRR): LRR C Lat: 40° 00' 40.44" N Long: -121° 57' 20.26" W Datum: WGS84

Soil Map Unit Name: Molinos Complex, Channeled (MzT) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☒, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?**	**Yes ☒ No ☐**
Hydric Soil Present?	Yes ☒	No ☐		
Wetland Hydrology Present?	Yes ☒	No ☐		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 15m²)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Alnus rhombifolia*	20	yes	FACW
2.			
3.			
4.			
50% = 10, 20% = 4	20	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15m²)			
1. *Cephalathus occidentalis*	80	yes	OBL
2. *Ficus carica*	2	no	FACU
3.			
4.			
5.			
50% = 41, 20% = 16.4	82	= Total Cover	
Herb Stratum (Plot size: 1m²)			
1. *Leersia oryzoides*	60	yes	OBL
2. *Panicum acuminatum*	trace	no	NL (UPL)
3. *Artemisia douglasiana*	trace	no	FAC
4. *Vitis californica*	2	no	FACU
5. *Melilotus alba*	trace	no	NL (UPL)
6. *Dysphania ambrosoides*	trace	no	FAC
7. *Xanthium strumarium*	trace	no	FAC
8.			
50% = 31, 20% = 12.4	62	= Total Cover	
Woody Vine Stratum (Plot size: 15m²)			
1. *Rubus armeniacus*	10	yes	FAC
2. *Vitis californica*	5	yes	FACU
50% = 7.5, 20% = 3	15	= Total Cover	
% Bare Ground in Herb Stratum 38	% Cover of Biotic Crust 0		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	4	(A)
Total Number of Dominant Species Across All Strata:	5	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	80	(A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species	140	x1 =	140
FACW species	20	x2 =	40
FAC species	10	x3 =	30
FACU species	9	x4 =	36
UPL species	0	x5 =	0
Column Totals:	179 (A)		246 (B)

Prevalence Index = B/A = 1.37

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks: Band of riparian vegetation underneath trees and shrubs on south bank of Deer Creek; species composition is variable, much of the ara within 15m² is barren sand in deep shade; herbacious vegetation mostly in light gap and along edges of tree canopy. Other woody species present outside of plot include Populus fremontii, Platanus racemosa, Salix lasiolepis in shrub layer; nearby herbs outside of plot include Equisetum arvense, Rumex crispus, Cyperus eragrostis, Stachys sp.

Project Site: Deer Creek DCID Dam Fish Passage Project

SOIL

Sampling Point: DP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	7.5YR 2.5/1	100					c.l. sand	
5-8	7.5YR 2.5/1	100					f.l. sand	
8-18	10YR 2/1	100					c.l. sand	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (Inches): _____

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Soils are sandy in nature and are a Problematic Hydric Soil: (Vegetated Sand and Gravel Bars within Floodplains).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☒ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☒ Sediment Deposits (B2) **(Riverine)**
- ☒ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☒ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):	_____
Water Table Present?	Yes	☒	No	☐	Depth (inches):	12
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	7

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Observations of higher flows earlier in the spring of 2017

Remarks: FAC-Neutral Test (OBL / FACW:FACU / UPL) = 3:1
Prior winter / spring was drier than normal

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: Deer Creek DCID Dam Fish Passage Project City/County: /Tehama Sampling Date: 6/22/18

Applicant/Owner: USFWS / DCID State: CA Sampling Point: DP-2

Investigator(s): J. Souza / J. Dittes Section, Township, Range: Section 23, Township 25 North, Range 1 West MDBM

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): LRR C Lat: 40° 00' 40.04" N Long: -121 57' 20.54" W Datum: WGS84

Soil Map Unit Name: Molinos Complex, Channeled (MzT) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☒, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?** **Yes** ☐ **No** ☒
Hydric Soil Present?	Yes ☐	No ☒	
Wetland Hydrology Present?	Yes ☐	No ☒	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 4m²)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Platanus racemosa*	85	yes	FAC
2.			
3.			
4.			
50% = 42.5, 20% = 17	85	= Total Cover	
Sapling/Shrub Stratum (Plot size: 4m²)			
1. *Frangula californica ssp. tomentella*	15	yes	NL (UPL)
2.			
3.			
4.			
5.			
50% = 7.5, 20% = 3	15	= Total Cover	
Herb Stratum (Plot size: 1m²)			
1. *Bromus diandrus / sterilis*	65	yes	NL (UPL)
2. *Torrilis arvensis*	5	no	NL (UPL)
3. *Quercus wislizenii*	trace	no	NL (UPL)
4. *Hordeum murinum*	trace	no	FACU
5. *Cynosurus echinatus*	trace	no	NL (UPL)
6.			
7.			
8.			
50% = 35, 20% = 14	70	= Total Cover	
Woody Vine Stratum (Plot size: 4m²)			
1. *Rubus armeniacus*	5	yes	FAC
2.			
50% = 2.5, 20% = 1	5	= Total Cover	

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust 0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50	(A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species		x1 =	
FACW species		x2 =	
FAC species	90	x3 =	270
FACU species		x4 =	
UPL species	85	x5 =	425
Column Totals:	175 (A)		695 (B)

Prevalence Index = B/A = 3.97

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks: On terrace/upper bank in shade of Platanus reacemosa and Alnus rhombifolia- the latter is rooted below and next to creek at this position; Quercus lobata also present at this position. Herbaceous layer completely lacks hydrophytic vegetation.

Project Site: Deer Creek DCID Dam Fish Passage Project

SOIL

Sampling Point: DP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 3/2	100					l. sand	very cobbly, single grain structure
7-18	10YR 3/3	100					l. sand	cobbly, s.a. blocky

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (Inches): _____

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Soils are sandy in nature and are a Problematic Hydric Soil: (Vegetated Sand and Gravel Bars within Floodplains).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches): _____
Water Table Present?	Yes	☐	No	☒	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches): _____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Prior winter / spring was drier than norma

FAC-Neutral Test (OBL / FACW:FACU / UPL) = 0:2l

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: Deer Creek DCID Dam Fish Passage Project City/County: /Tehama Sampling Date: 6/22/18

Applicant/Owner: USFWS / DCID State: CA Sampling Point: DP-3

Investigator(s): J. Souza / J. Dittes Section, Township, Range: Section 22, Township 25 North, Range 1 West MDBM

Landform (hillslope, terrace, etc.): meadow Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): LRR C Lat: 40° 00' 02.36" N Long: -121° 57' 35.46" W Datum: WGS84

Soil Map Unit Name: Millrace gravelly fine sandy loam, 0 to 3 percent slopes (Mp) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?** **Yes** ☒ **No** ☐
Hydric Soil Present?	Yes ☒	No ☐	
Wetland Hydrology Present?	Yes ☒	No ☐	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50% = _____, 20% = _____		= Total Cover	
Sapling/Shrub Stratum (Plot size:_____)			
1.			
2.			
3.			
4.			
5.			
50% = _____, 20% = _____		= Total Cover	
Herb Stratum (Plot size:0.5m²)			
1. *Glyceria declinata*	35	yes	FACW
2. *Eleocharis macrostachya*	15	yes	OBL
3. *Mimulus gutattus*	15	yes	OBL
4. *Lythrum hyssopifolia*	10	no	OBL
5. *Leontodon saxatilis*	trace	no	FACU
6. *Juncus bufonius*	trace	no	FACW
7. *Centaurium tenuiflorum*	trace	no	FACW
8.			
50% = 37.5, 20% = 15	75	= Total Cover	
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
50% = _____, 20% = _____		= Total Cover	

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust 20

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species	40	x1 =	40
FACW species	35	x2 =	70
FAC species		x3 =	
FACU species		x4 =	
UPL species		x5 =	
Column Totals:	75 (A)		110 (B)

Prevalence Index = B/A = 1.47

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: E. macrostachya not listed in Lichvar 2016 plant list, but assumed Obligate species.

Project Site: Deer Creek DCID Dam Fish Passage Project

SOIL

Sampling Point: DP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/2	95	5YR 5/8	5	C	PL	s. loam	
1-6	10YR 3/2	85	2.5 YR 4/8	15	C	PL/M	s.c. loam	
6-12	7.5YR 3/2	100					s.c. loam	heavy clay loam

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: clay

Depth (Inches): 12

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☒ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):
Water Table Present?	Yes	☐	No	☒	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: 3 feet from flowing water, heavy clay keeping water from moving horizontally.

FAC-Neutral Test (OBL / FACW:FACU / UPL) = 3:0

Prior winter / spring was drier than normal

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: Deer Creek DCID Dam Fish Passage Project City/County: Vina/Tehama Sampling Date: 6/22/18

Applicant/Owner: USFWS / DCID State: CA Sampling Point: DP-4

Investigator(s): J. Souza / J. Dittes Section, Township, Range: Section 22, Township 25 North, Range 1 West MDBM

Landform (hillslope, terrace, etc.): plains Local relief (concave, convex, none): convex Slope (%): 3

Subregion (LRR): LRR C Lat: 40° 00' 02.16" N Long: -121 °57' 35.47" W Datum: WGS84

Soil Map Unit Name: Millrace gravelly fine sandy loam, 0 to 3 percent slopes (Mp) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?** **Yes** ☐ **No** ☒
Hydric Soil Present?	Yes ☒	No ☐	
Wetland Hydrology Present?	Yes ☒	No ☐	

Remarks: **Data point is very near wetland boundary; soils and hydrology indicators present in clayey soils, however vegetation completely lacks hydrophytic species.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	____	____
2. _____	_____	____	____
3. _____	_____	____	____
4. _____	_____	____	____
50% = _____, 20% = _____	_____	= Total Cover	
Sapling/Shrub Stratum (Plot size:_____)			
1. _____	_____	____	____
2. _____	_____	____	____
3. _____	_____	____	____
4. _____	_____	____	____
5. _____	_____	____	____
50% = _____, 20% = _____	_____	= Total Cover	
Herb Stratum (Plot size:0.5m²)			
1. *Centaurea solstitialis*	30	yes	NL (UPL)
2. *Avena barbata*	15	no	NL (UPL)
3. *Bromus hordeaceus*	30	yes	FACU
4. *Cynodon dactylon*	5	no	FACU
5. *Petrophagia dubia*	trace	no	NL (UPL)
6. *Taeniatherum caput-medusae*	trace	no	NL (UPL)
7. *Aira caryophyllea*	trace	no	FACU
8. *Erodium botrys*	trace	no	FACU
50% = 40, 20% = 16	80	= Total Cover	
Woody Vine Stratum (Plot size:_____)			
1. _____	_____	____	____
2. _____	_____	____	____
50% = _____, 20% = _____	_____	= Total Cover	
% Bare Ground in Herb Stratum 15	% Cover of Biotic Crust 0		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0	(A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	35	x4 =	140
UPL species	45	x5 =	225
Column Totals:	80 (A)		365 (B)

Prevalence Index = B/A = 4.56

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks:

Project Site: Deer Creek DCID Dam Fish Passage Project

SOIL

Sampling Point: DP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	7.5YR 3/2	90	2.5YR 4/8	10	C	PL	si. loam	
3-9	7.5YR 3/2	80	2.5YR 4/8	20	C	M/PL	si.c. loam	Mn concretions

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Rock/hardened clay

Depth (Inches): 9"

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Cobble cemented in hard clay underlying

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):
Water Table Present?	Yes	☐	No	☒	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Just 2 feet from wetland boundary; prior winter / spring was drier than normal ; source of hydrology is from nearby ditch stystem

FAC-Neutral Test (OBL / FACW:FACU / UPL) = 0:2

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: Deer Creek DCID Dam Fish Passage Project City/County: /Tehama Co. Sampling Date: 12/19/18

Applicant/Owner: USFWS / DCID State: CA Sampling Point: DP-5

Investigator(s): J. Souza / J. Dittes Section, Township, Range: Section 22, Township 25 North, Range 1 West MDBM

Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 6

Subregion (LRR): LRR C Lat: 40° 00' 23.55" N Long: -121° 57' 30.66" W Datum: WGS84

Soil Map Unit Name: Anita cobbly clay (An) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?** **Yes** ☐ **No** ☒
Hydric Soil Present?	Yes ☐	No ☒	
Wetland Hydrology Present?	Yes ☐	No ☒	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: N/A)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50% = _____, 20% = _____		= Total Cover	
Sapling/Shrub Stratum (Plot size: N/A)			
1.			
2.			
3.			
4.			
5.			
50% = _____, 20% = _____		= Total Cover	
Herb Stratum (Plot size: 0.5m²)			
1. *Erodium botrys*	60	yes	FACU
2. *Elymus caput-medusae*	10	no	UPL
3. *Trifolium glomeratum*	Trace	no	UPL
4. *Bromus hordeaceus*	5	no	FACU
5. *Lupinus bicolor*	Trace	no	UPL
6. *Lepidium nitidum*	Trace	no	FAC
7. *Filago gallica*	Trace	no	UPL
8. *Unknown seedlings*	5	no	-
50% = 40, 20% = 16	80	= Total Cover	
Woody Vine Stratum (Plot size: N/A)			
1.			
2.			
50% = _____, 20% = _____		= Total Cover	

% Bare Ground in Herb Stratum 15 % Cover of Biotic Crust 0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0	(A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species	0	x1 =	
FACW species	0	x2 =	
FAC species	0	x3 =	
FACU species	65	x4 =	260
UPL species	10	x5 =	50
Column Totals:	75 (A)		310 (B)

Prevalence Index = B/A = 4.13

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☐ **No** ☒

Remarks:

Project Site: Deer Creek DCID Dam Fish Passage Project

SOIL

Sampling Point: DP-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	7.5YR 3/2	100					Sa. loam	S/A Blocky
8-18	10YR 3/2	100					Clay loam	Massive
18+	7.5YR 3/3	100					Clay loam	Massive

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (Inches): _____

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: 18+ strata is cobbly, stony, clay loam.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):	_____
Water Table Present?	Yes	☐	No	☒	Depth (inches):	_____
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	18+

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: FAC-Neutral Test (OBL / FACW:FACU / UPL) = 0:1 Not Met

APPENDIX B

Ordinary High Water Mark Datasheets

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: DCID
Project Number: 1801
Stream: Unnamed tributary to Deer Creek
Investigator(s): Jeff Souza, Lorin Mills

Date: 6/19/18 **Time:** 1:48pm
Town: Vina **State:** CA
Photo begin file#: **Photo end file#:**

Y [X] / N [ ] Do normal circumstances exist on the site?

Y [ ] / N [X] Is the site significantly disturbed?

Location Details: North bank Deer Creek, due north of Diversion

Projection: **Datum:**
Coordinates: 40.0125, -121.9548

Potential anthropogenic influences on the channel system:

N/A

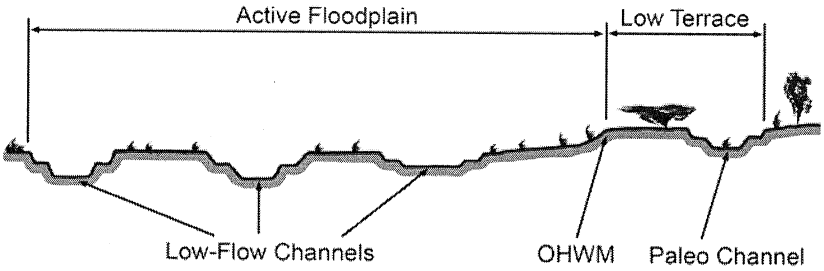
Brief site description:

Ephemeral Stream north of diversion dam

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [X] Topographic maps
- [ ] Geologic maps
- [ ] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
  - [ ] History of recent effective discharges
  - [ ] Results of flood frequency analysis
  - [ ] Most recent shift-adjusted rating
  - [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

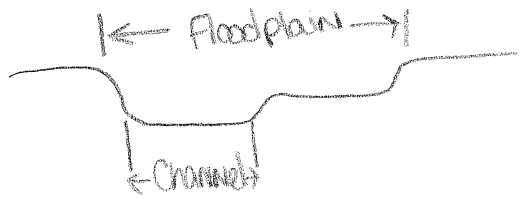


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - [ ] Mapping on aerial photograph
   - [ ] Digitized on computer
   - [X] GPS
   - [ ] Other:

Project ID: **Cross section ID:** #1 **Date:** 6/19/18 **Time:** 1:48pm

Cross section drawing:



OHWM

GPS point: ES-001

Indicators:

- [x] Change in average sediment texture
- [ ] Change in vegetation species
- [x] Change in vegetation cover
- [x] Break in bank slope
- [ ] Other: _____
- [ ] Other: _____

Comments:

Floodplain unit:

- [ ] Low-Flow Channel
- [x] Active Floodplain
- [ ] Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: very fine sand, coarse silt

Total veg cover: 100 % Tree: 100 % Shrub: 0 % Herb: 100 %

Community successional stage:

- [ ] NA
- [ ] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [x] Late (herbaceous, shrubs, mature trees)

Indicators:

- [ ] Mudcracks
- [ ] Ripples
- [x] Drift and/or debris
- [x] Presence of bed and bank
- [x] Benches
- [x] Soil development
- [x] Surface relief
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

Comments:

APPENDIX C

Site Photos

Photo 1. View of Wetland Delineation Data Point DP-1 located in Riparian Wetland feature RW-3 as depicted in Figure 5, looking north. Photo date: June 22, 2018.

Photo 2. View of Wetland Delineation Data Point DP-2 located in Riparian Wetland feature RW-3 as depicted in Figure 5, looking east. Photo date: June 22, 2018.

Photo 3. View of Wetland Delineation Data Points DP-3 (left white flag) and DP-4 (right white flag), located in the Ditch/Wet Meadow Complex adjacent to the south access road as depicted in Figure 5, looking east. The pink flags represent the delineated wetland boundary. Photo date: June 22, 2018.

Photo 4. View of the irrigation ditch looking west. Photo date: March 29, 2018.

Photo 5. View of Perennial Stream feature PS-1 and Riparian Wetland feature RW-2, looking downstream to the west. Photo date: May 10, 2018.

Photo 6. View of Ephemeral Stream feature ES-1, looking north. Photo date: May 10, 2018.

Photo 7. View of Deer Creek (PS-1) looking upstream towards the DCID Dam, with Riparian feature RW-1 on the left and Riparian feature RW-3 on the right. Photo date: May 10, 2018.

Photo 8. View of Ditch downstream of the dam and fish screen, looking west. Photo date: Photo date: March 29, 2018.

Photo 9. View of Seasonal Wetland feature SW-1 as depicted in Figure 5, looking east. The pink flags represent the delineated boundary. Photo date: May 18, 2018.

Photo 10. View of the northern road realignment of the south access road, looking east. Road centerline is demarcated with stakes and was designed to avoid sensitive cultural resources. Photo date: December 19, 2018.

Photo 11. View of Wetland Delineation Data Point DP-5 (white flag) located within the northern road realignment of the south access road, looking north. Photo date: December 19, 2018.

Photo 12. View of the southern road realignment of the south access road, looking north. Photo date: December 19, 2018.