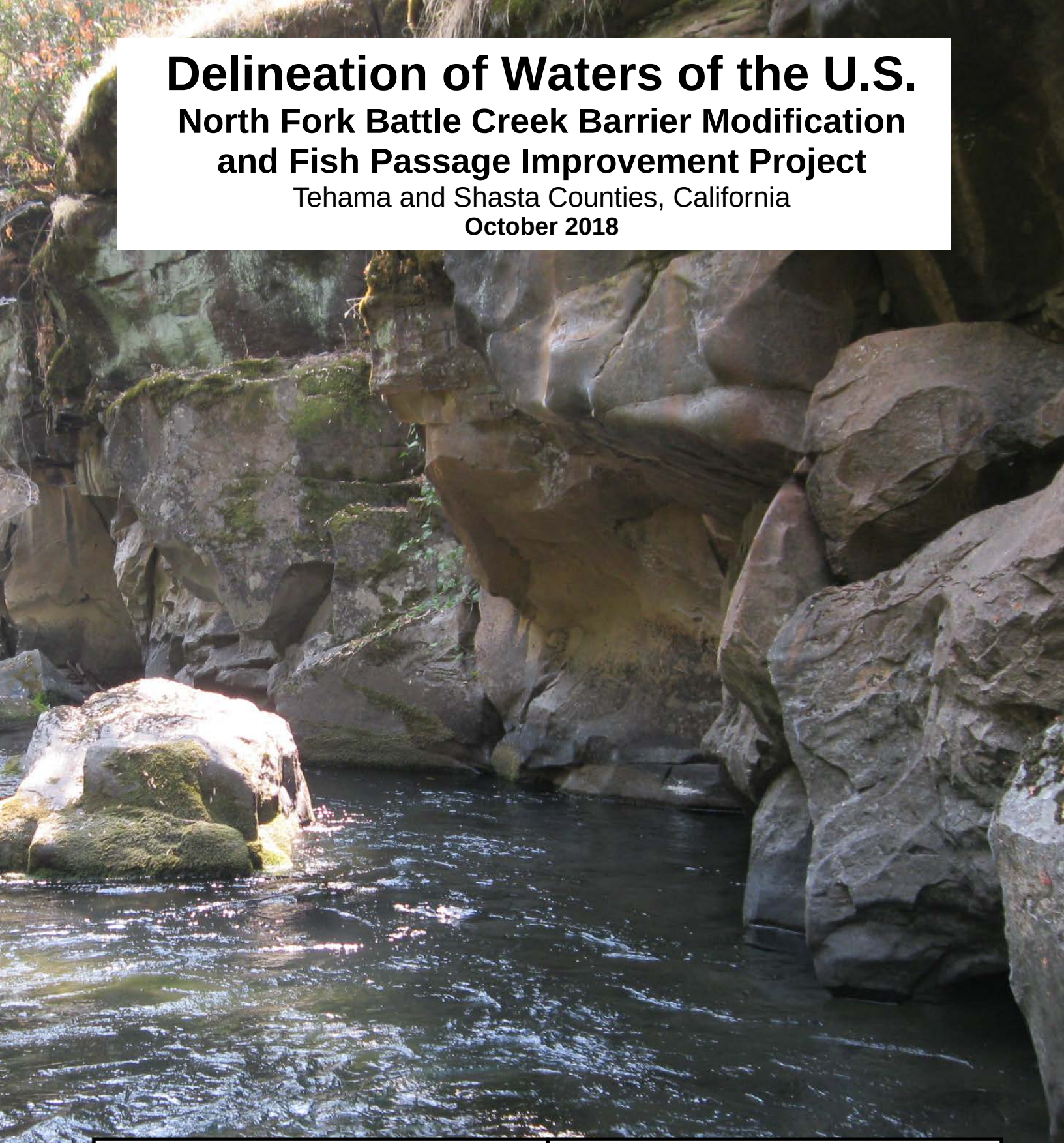
Delineation of Waters of the U.S.

North Fork Battle Creek Barrier Modification and Fish Passage Improvement Project

Tehama and Shasta Counties, California

October 2018



Prepared for:

Red Bluff Fish and Wildlife Office
10590 Tyler Road
Red Bluff, CA 96080

Prepared by:

TEHAMA
ENVIRONMENTAL SOLUTIONS, INC.

910 Main Street, Suite D, Red Bluff, CA 96080
(530) 528-8272

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INTRODUCTION

This Delineation of Waters of the U.S. (delineation) was conducted for the U.S. Fish and Wildlife Service (USFWS) by Tehama Environmental Solutions, Inc. (TES) for the North Fork Battle Creek Barrier Modification and Fish Passage Improvement Project (project). TES was retained by the USFWS under grant agreement F18AP00099 to prepare this delineation.

The purpose of this delineation is to identify and quantify "Waters of the United States" that may fall within the jurisdiction of the U.S. 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* (U.S. Army Corps of Engineers 2016a) and the *Updated Map and Drawing Standards for the South Pacific Division Regulatory Program* (U.S. 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 within Eagle Canyon on North Fork Battle Creek, at approximately 21 river miles upstream of the confluence with the Sacramento River, west of Manton, in Shasta and Tehama Counties, California (Figure 1). Specifically, the study area is located in Sections 24, 25, and 36, Township 30 North, Range 1 West, Mount Diablo Base and Meridian; within the 7.5-minute United States Geological Survey Shingletown quadrangle map (Figure 2).

To access the south bank of the site from Interstate 5 in Red Bluff, travel east on Highway 36 / Antelope Boulevard for 2.0 miles. Turn left onto Highway 36 East and continue for 11.3 miles. Turn left onto Long Road / Manton Road and continue for 12.8 miles. A locked gate will be on your left which requires the property owner's permission to enter. From the Long Road / Manton Road access gate traveling north, it is approximately 0.75 miles to the project site.

To access the north bank of the site from Interstate 5 in Red Bluff, travel east on Highway 36 / Antelope Boulevard for 2.0 miles. Turn left onto Highway 36 East and continue for 11.3 miles. Turn left onto Long Road / Manton Road and continue for 8.8 miles. Turn left onto Wildcat Road and continue for 2.3 miles and turn right onto Battle Creek Bottom Road. Continue east on Battle Creek Bottom Road for 3.3 miles. A locked gate will be on your right which requires the property owner's permission to enter. From the Battle Creek Bottom Road access gate traveling south, it is approximately 1.0 mile to the project area.

Proposed Project

The purpose of the proposed project is to improve passage conditions for adult Chinook salmon and steelhead in Battle Creek. Two natural boulder barriers, the Upper and Lower Barrier Sites are complete barriers for fish passage during all flow conditions (Michael Love and Associates 2017).

The project is being implemented by the USFWS and the California Department of Fish and Wildlife (CDFW), in cooperation with the North Fork Battle Creek Barrier Modification and Fish Passage Improvement Project Technical Advisory Committee which is composed of representatives from the National Marine Fisheries Service (NMFS), the Central Valley Regional Water Quality Control Board, the Corps, and several private consulting firms.

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FIGURE 1

Site Vicinity Map

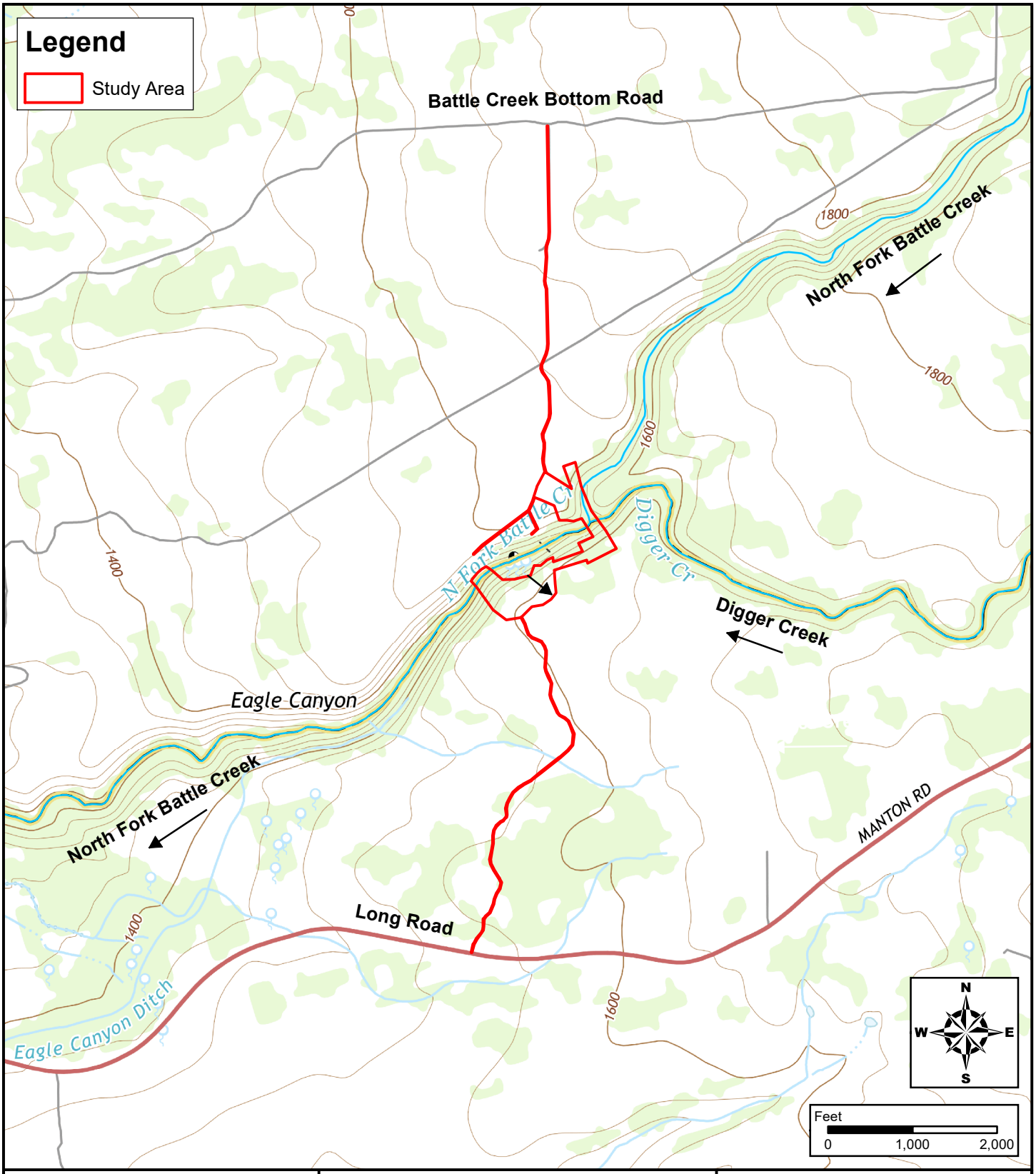

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FIGURE 2

Site Location Map

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

Contact Information

Project Applicant
U.S. Fish and Wildlife Service
Ms. Laurie Earley, Supervisory Fish Biologist
Red Bluff Fish and Wildlife Office
10950 Tyler Road
Red Bluff, California 96080
(530) 527-3043, ext. 262
Laurie_Earley@fws.gov

Property Owners
Mr. David Gamon and Ms. April Gage
APN: 704260024000
APN: 704260010000

Davis Ranch
APN: 011020004000
APN: 011020011000

ENVIRONMENTAL SETTING

General Site Characteristics

The study area is located in the foothills of the southernmost extent of the Cascade Range, west of Manton, California. North Fork Battle Creek and Digger Creek serve as the boundary between Shasta and Tehama Counties. Digger Creek is a tributary to North Fork Battle Creek, which is a tributary to Battle Creek, a tributary to the Sacramento River. The site is comprised of terrain which is generally gradually sloping and with vertical 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 1,600 feet above mean sea level near the upper barrier site above the canyon, to 1,490 feet above mean sea level at the bottom of the canyon near the lower barrier site.

Land Use

Pacific Gas & Electric (PG&E) operates the Eagle Canyon diversion near the study area, which is used to divert water for hydroelectric power generation. The remainder of the study area is primarily used as rangeland for livestock grazing.

Hydrology

Battle Creek is an approximately 47-mile long perennial stream flowing generally west, originating from the western-facing slopes of Mount Lassen and eventually flowing into the Sacramento River near the town of Cottonwood, California. The Battle Creek watershed includes a total area of 370 square miles and drains from east to west. Downstream of the Eagle Canyon diversion, the creek flows for about fifteen river miles before reaching the Sacramento River. Digger Creek, a 19-mile long tributary, flows into North Fork Battle Creek just below at the upper barrier site.

Battle Creek exhibits a unique hydrology from the volcanic nature of the drainage. Seasonal precipitation percolates through the volcanic strata and emerges throughout the watershed as cold springs year-round. This can be seen on the south bank of Battle Creek at Eagle Canyon, where water actively seeps out of the canyon wall and into the creek below.

The Eagle Canyon diversion, located between the upper and lower barrier sites, diverts water into a series of flumes and tunnels that travel through the study area, and are owned by PG&E. Water diversion is to be managed under a 1999 Memorandum of Understanding (MOU) between NMFS, U.S. Bureau of Reclamation, USFWS, CDFW and PG&E, which outlines the minimum in-stream flow requirements below various diversion dams (Michael Love and Associates 2017). The minimum in-stream flow requirements under the MOU vary by month and range from 35-46 cubic feet per second (cfs). The current diversions are directed through an Interim Flow Agreement (30 +/- 5 cfs) that provides immediate improvements to habitat for salmonids while the Battle Creek Salmon and Steelhead Restoration Project is implemented.

Soils

Eight different soil map units occur within the study area (Figure 3) according to the local soil surveys (U.S. Department of Agriculture–Soil Conservation Service et al. 1967, U.S. Department of Agriculture–Soil Conservation Service et al. 1974). The eight identified map units are listed below:

<u>Guenoc stony loam, 10 to 30 percent slopes (GsD)</u>
These soils occur on the foothills east of the Sacramento River. They are formed in material weathered from volcanic and metamorphic rocks. The soil is well-drained, with moderately slow permeability and medium to rapid runoff. The taxonomy of the map unit is fine, kaolinitic, thermic, Typic Rhodoxeralfs (Natural Resources Conservation Service 2018).

<u>Guenoc very stony loam, 0 to 30 percent slopes (GsD)</u>
These soils occur on the foothills east of the Sacramento River. They are formed in material weathered from volcanic and metamorphic rocks. The soil is well-drained, with moderately slow permeability and medium to rapid runoff. Andesite bedrock occurs at a depth of 30 to 40 inches. The taxonomy of the map unit is fine, kaolinitic, thermic, Typic Rhodoxeralfs (Natural Resources Conservation Service 2018).

<u>Guenoc very rocky loam, 0 to 30 percent slopes (GuD)</u>
These soils occur on the foothills east of the Sacramento River. They are formed in material weathered from volcanic and metamorphic rock. The soil is well-drained, with moderately slow permeability and slow to rapid runoff. Andesite bedrock occurs at a depth of 20 to 30 inches. The taxonomy of the map unit is fine, kaolinitic, thermic, Typic Rhodoxeralfs (Natural Resources Conservation Service 2018).

<u>Inks cobbly loam, 3 to 30 percent slopes (IcD)</u>
These soils are located on rounded hills east of the Sacramento River. They are formed in material from weakly consolidated volcanic rock, particularly andesite and basalt. The soil is well-drained, with medium runoff and moderate permeability. The taxonomy of the map unit is loamy-skeletal, mixed, superactive, thermic, shallow Ultic Argixerolls (Natural Resources Conservation Service 2018).

<u>Rockland (RtF)</u>
This land type is located on very steep slopes or on sloping lava flows that consist of more than 50 percent exposed rock. The series is not classified taxonomically by higher categories in the soil survey.

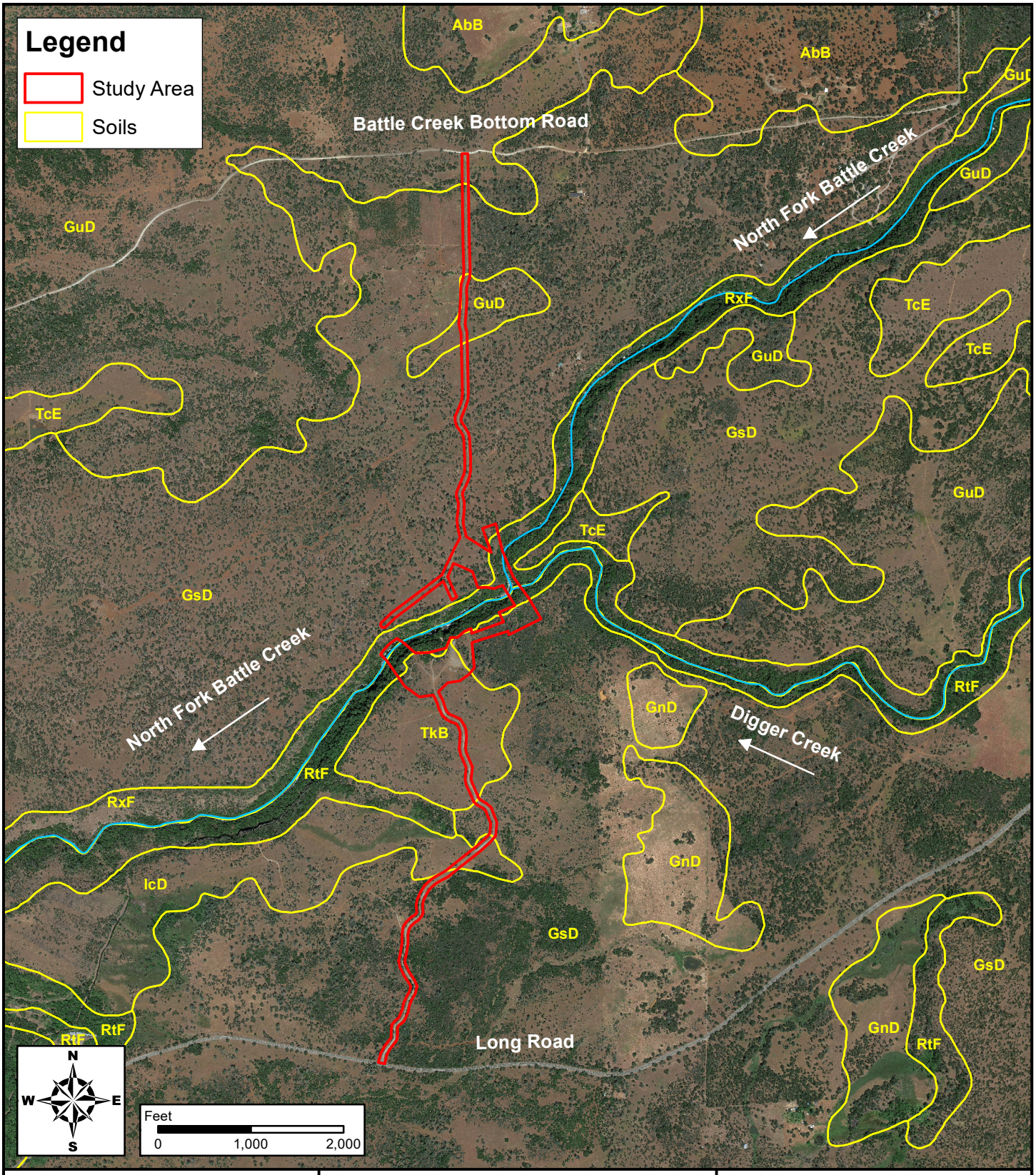

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FIGURE 3

Soil Survey Map

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

PHOTO SOURCE: Google Earth, 5/25/2017

Rockland (RxF)
This land type is located on uplands of mountainous areas. Rockland consists of shale, sandstone, conglomerate, limestone, greenstone, quartz diorite, andesite, basalt, rhyolite, schist, gneiss, serpentine, or peridotite rock outcrops and covers 25 to 90 percent of the surface. The series is not classified taxonomically by higher categories in the soil survey.

Toomes very rocky loam, 0 to 50 percent slopes (TcE)
These soils are located east of the Sacramento River formed in material derived from volcanic rock. They are underlain by tuff breccia. The soil is somewhat excessively drained, with moderate permeability and medium to rapid runoff. Bedrock exists at a depth of four to ten inches. The taxonomy of the map unit is loamy, mixed, thermic, lithic Ruptic-xerorthentic Xerochrepts (Natural Resources Conservation Service 2018).

Toomes very rocky silt loam, 1 to 10 percent slopes (TkB)
These soils are located east of the Sacramento River and formed in material derived from volcanic rock. They are underlain by tuff breccia. The soil is well-drained, with moderate permeability and medium runoff. The taxonomy of the map unit is loamy, mixed, thermic, lithic Ruptic-xerorthentic Xerochrepts (Natural Resources Conservation Service 2018).

Vegetation / Plant Communities

Four 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: Blue Oak-Foothill Pine, Mixed Chaparral, Riverine and Montane Hardwood.

Blue Oak-Foothill Pine
The Blue Oak-Foothill Pine habitat occurs on the upland flats of the study area. The habitat is dominated by blue oak *(Quercus douglasii)*, foothill pine *(Pinus sabiniana)* and interior live oak *(Quercus wislizenii)* in the tree layer. There is no shrub layer in the majority of blue oak woodland, however buckbrush *(Ceanothus cuneatus)* and western juniper *(Juniperis occidentalis)* occur in areas. The herbaceous vegetation, when present, tends to be primarily annual grasses and forbs.

Mixed Chaparral
Mixed chaparral occurs on the upland flats of the study area and is dominated by buckbrush, with little to no tree component. Flannelbush *(Fremontodendron californicum)*, California yerba-santa *(Eriodictyon californicum)*, white-leaved manzanita *(Arctostaphylos viscida ssp. viscida)* and birch-leaved mountain mahogany *(Cercocarpus betuloides)* are present in areas. Herbaceous vegetation is typically sparse, if present, and is composed primarily of annual grasses and forbs.

Riverine
Riverine habitat is present within the channels of North Fork Battle Creek and Digger Creek. The creek channel is primarily devoid of vegetation, but the exposed barren rock along both banks of the stream occasionally supports scattered woody and herbaceous species such as willows *(Salix spp.)*, Oregon ash *(Fraxinus latifolia)*, white alder *(Alnus rhombifolia)*, Himalayan blackberry (*Rubus armeniacus*) and Indian rhubarb *(Darmera peltata)*.

Montane Hardwood
Montane Hardwood habitat is present on the slopes within the North Fork Battle Creek and Digger Creek canyon. Canyon live oak *(Quercus chrysolepis)* and bay laurel *(Umbellularia californica)* dominate the tree overstory providing approximately 90 percent canopy coverage. Other tree species include blue oak and big-leaf maple *(Acer macrophyllum)*, along with an occasional nutmeg *(Torreya californica)*, incense

cedar *(Calocedrus decurrens)* and ponderosa pine *(Pinus ponderosa)*. Shrubs include poison oak *(Toxicodendron diversilobum)*, California buckeye *(Aesculus californica)*, buckbrush, birch-leaved mountain mahogany and an occasional blue elderberry *(Sambucus nigra var. caerulea)*. Species indicative of Valley Foothill Riparian habitat are also present within groundwater seep areas along the south canyon wall. Woody species include edible fig *(Ficus carica)*, spicebush *(Calycanthus occidentalis)*, white alder, Himalayan blackberry and California grape *(Vitis californica)*. Herbaceous species, when present, include seep monkeyflower *(Mimulus guttatus)*, willowherb *(Epilobium sp.)* and ferns.

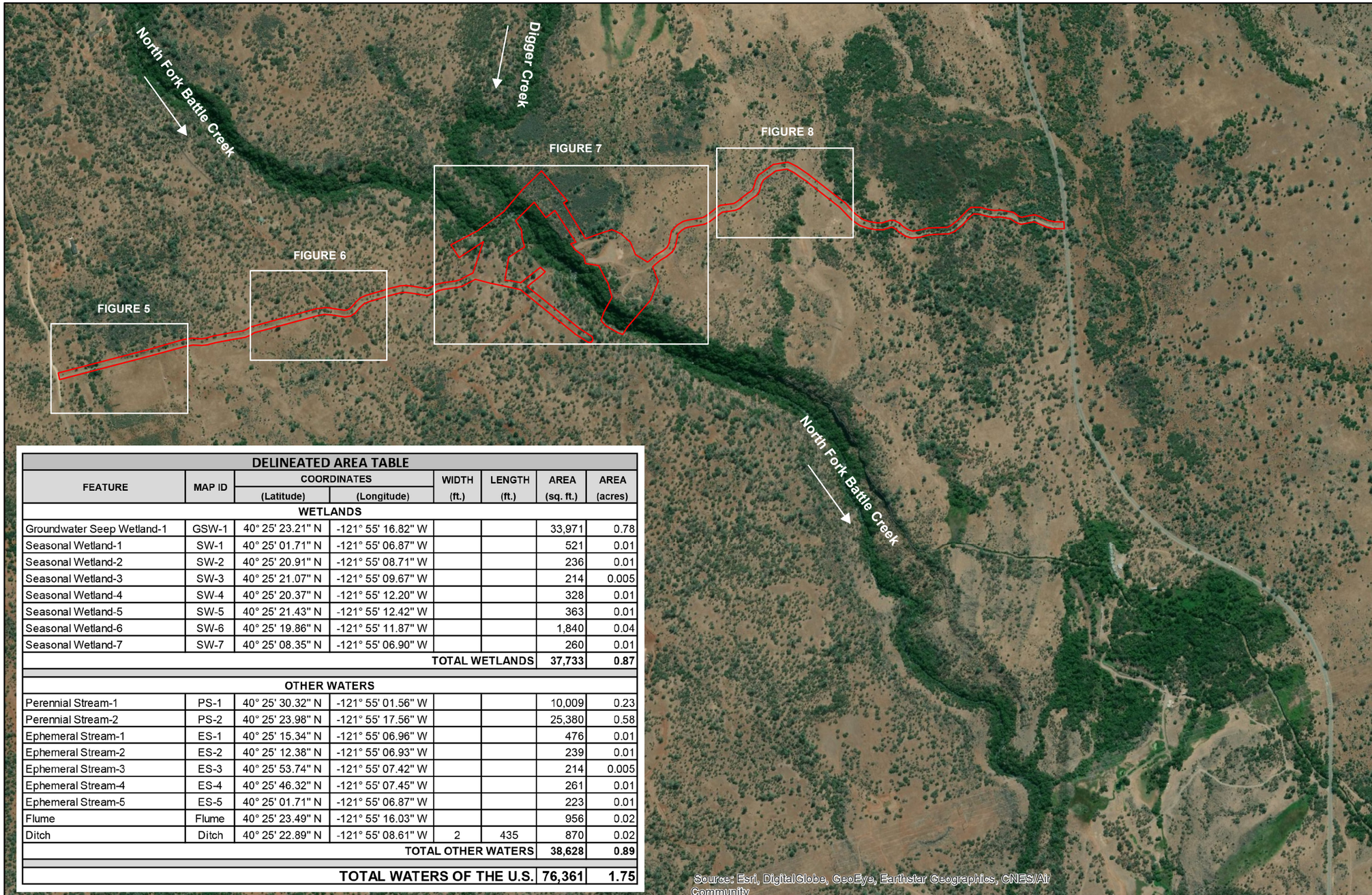
METHODS

A delineation of waters of the U.S. was conducted within the study area by Mr. Jeff Souza, TES Senior Biologist, and Ms. Lorin Mills, TES Environmental Scientist on May 30, 2018; by Mr. Souza and Mr. John Dittes, Dittes and Guardino Consulting Senior Botanist on June 20, 2018; and by Mr. Souza and Mr. Brandon Vidrio, TES Biologist on August 15, 2018 and August 22, 2018. 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. Two data points were characterized to determine the presence or absence of the three wetland parameters (vegetation, soils and hydrology). The data forms for the two 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 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 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. Where safety issues and / or lack of access to sufficient satellite coverage precluded GPS data collection, the boundaries of identified wetlands and waters were mapped in the field using photo bases derived from Google Earth and /or drone-collected imagery, and then digitized onto rectified digital imagery. All area features less than one meter 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, 0.87 acres of potentially jurisdictional wetlands were identified and delineated. Based on the presence of an OHWM, 0.89 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



DELINEATED AREA TABLE							
FEATURE	MAP ID	COORDINATES (Latitude)	COORDINATES (Longitude)	WIDTH (ft.)	LENGTH (ft.)	AREA (sq. ft.)	AREA (acres)
WETLANDS							
Groundwater Seep Wetland-1	GSW-1	40° 25' 23.21" N	-121° 55' 16.82" W			33,971	0.78
Seasonal Wetland-1	SW-1	40° 25' 01.71" N	-121° 55' 06.87" W			521	0.01
Seasonal Wetland-2	SW-2	40° 25' 20.91" N	-121° 55' 08.71" W			236	0.01
Seasonal Wetland-3	SW-3	40° 25' 21.07" N	-121° 55' 09.67" W			214	0.005
Seasonal Wetland-4	SW-4	40° 25' 20.37" N	-121° 55' 12.20" W			328	0.01
Seasonal Wetland-5	SW-5	40° 25' 21.43" N	-121° 55' 12.42" W			363	0.01
Seasonal Wetland-6	SW-6	40° 25' 19.86" N	-121° 55' 11.87" W			1,840	0.04
Seasonal Wetland-7	SW-7	40° 25' 08.35" N	-121° 55' 06.90" W			260	0.01
					TOTAL WETLANDS	37,733	0.87
OTHER WATERS							
Perennial Stream-1	PS-1	40° 25' 30.32" N	-121° 55' 01.56" W			10,009	0.23
Perennial Stream-2	PS-2	40° 25' 23.98" N	-121° 55' 17.56" W			25,380	0.58
Ephemeral Stream-1	ES-1	40° 25' 15.34" N	-121° 55' 06.96" W			476	0.01
Ephemeral Stream-2	ES-2	40° 25' 12.38" N	-121° 55' 06.93" W			239	0.01
Ephemeral Stream-3	ES-3	40° 25' 53.74" N	-121° 55' 07.42" W			214	0.005
Ephemeral Stream-4	ES-4	40° 25' 46.32" N	-121° 55' 07.45" W			261	0.01
Ephemeral Stream-5	ES-5	40° 25' 01.71" N	-121° 55' 06.87" W			223	0.01
Flume	Flume	40° 25' 23.49" N	-121° 55' 16.03" W			956	0.02
Ditch	Ditch	40° 25' 22.89" N	-121° 55' 08.61" W	2	435	870	0.02
					TOTAL OTHER WATERS	38,628	0.89
					TOTAL WATERS OF THE U.S.	76,361	1.75

Legend

Study Area (34.7 acres)

Preliminary Delineation Map Overview

FIGURE 4

DELINEATION

Jeff Souza
Lorin Mills
Brandon Vidrio
Tehama Environmental Solutions, Inc.

John Dittes
Dittes and Guardino Consulting

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U.S. FISH & WILDLIFE SERVICE
DEPARTMENT OF THE INTERIOR

Red Bluff Fish and Wildlife Office
10950 Tyler Road
Red Bluff, California 96080
Phone 530-527-3043

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910 Main Street, Suite D, Red Bluff, CA 96080
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SCALE

0 1,000 2,000 Feet

1 in = 1,000 ft (11" X 17" paper)

October 2018

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

Legend

- Study Area (34.7 acres)
- Perennial Stream
- Seasonal Wetland
- Ephemeral Stream
- Groundwater Seep Wetland
- Flume
- Culvert
- OHWM Data Sheet Cross Section
- Ditch
- OHWM
- Data Points

Preliminary Delineation Map

FIGURE 5

DELINEATION

Jeff Souza
Lorin Mills
Brandon Vidrio
Tehama Environmental Solutions, Inc.

John Dittes
Dittes and Guardino Consulting

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Red Bluff Fish and Wildlife Office
10950 Tyler Road
Red Bluff, California 96080
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SCALE

0 100 200 Feet

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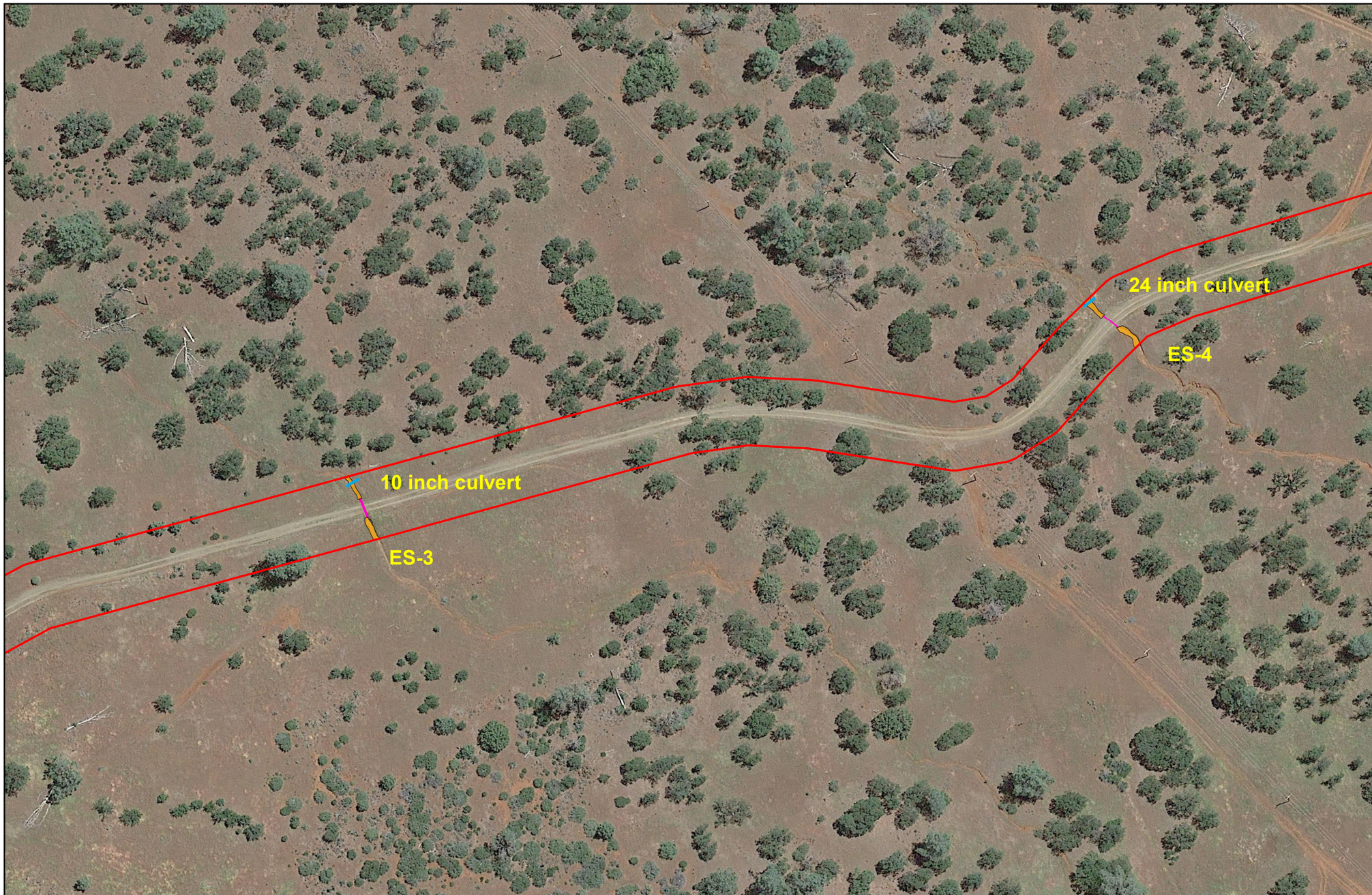

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- Flume
- Culvert
- OHWM Data Sheet Cross Section
- Ditch
- OHWM
- Data Points

Preliminary Delineation Map

FIGURE 6

DELINEATION

Jeff Souza
Lorin Mills
Brandon Vidrio
Tehama Environmental Solutions, Inc.

John Dittes
Dittes and Guardino Consulting

CLIENT

Red Bluff Fish and Wildlife Office
10950 Tyler Road
Red Bluff, California 96080
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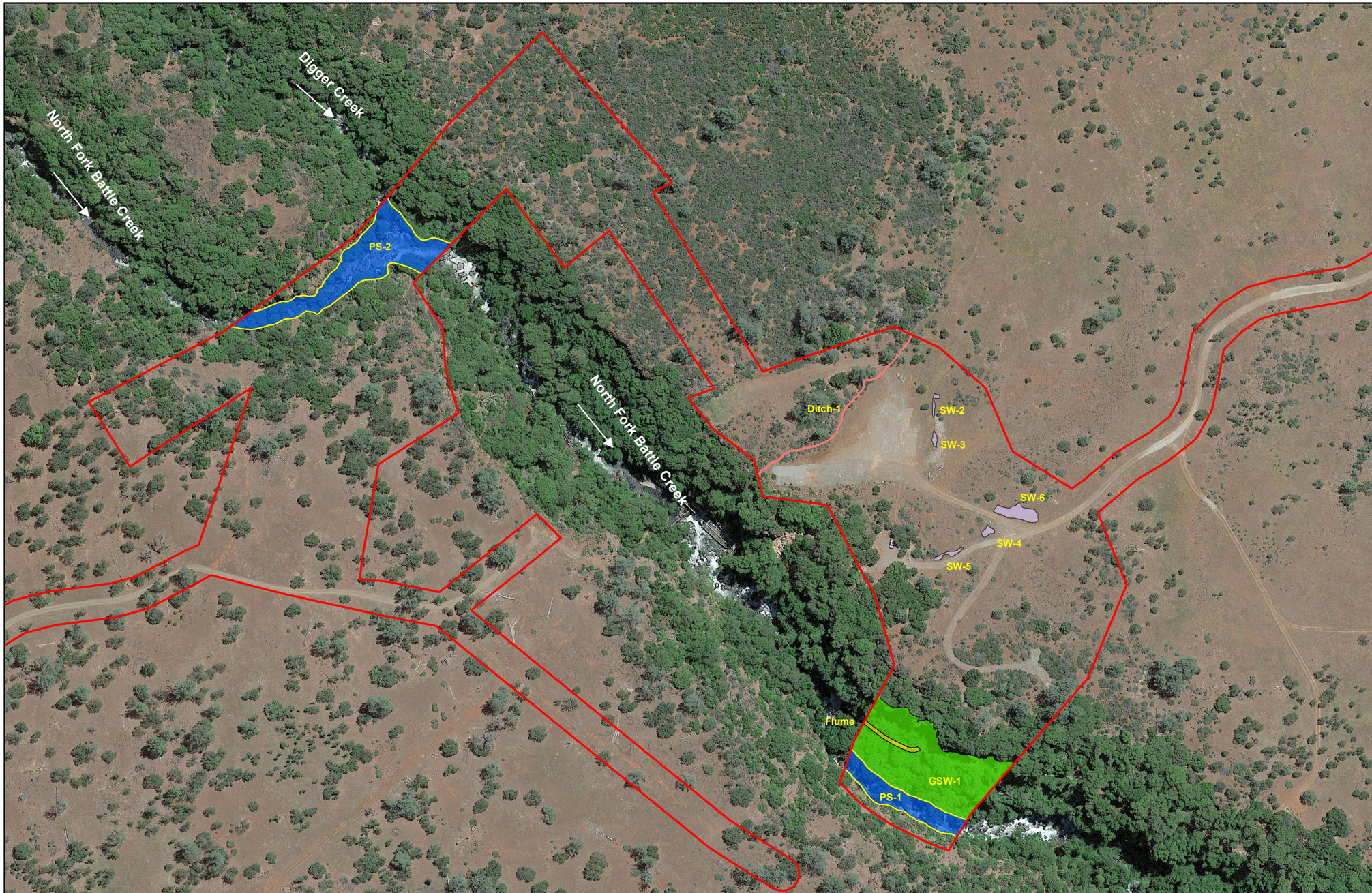

Legend

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Preliminary Delineation Map

FIGURE 7

DELINEATION

Jeff Souza
Lorin Mills
Brandon Vidrio
Tehama Environmental Solutions, Inc.

John Dittes
Dittes and Guardino Consulting

CLIENT

Red Bluff Fish and Wildlife Office
10950 Tyler Road
Red Bluff, California 96080
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SCALE

0 200 400 Feet

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

October 2018

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Legend

- Study Area (34.7 acres)
- Perennial Stream
- Seasonal Wetland
- Ephemeral Stream
- Groundwater Seep Wetland
- Flume
- Culvert
- OHWM Data Sheet Cross Section
- Ditch
- OHWM
- Data Points

Preliminary Delineation Map

FIGURE 8

DELINEATION

Jeff Souza
Lorin Mills
Brandon Vidrio
Tehama Environmental Solutions, Inc.

John Dittes
Dittes and Guardino Consulting

CLIENT

Red Bluff Fish and Wildlife Office
10950 Tyler Road
Red Bluff, California 96080
Phone 530-527-3043

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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.

TABLE 1 SUMMARY OF PRELIMINARY DELINEATED WATERS OF THE U.S. North Fork Battle Creek Barrier Modification and Fish Passage Improvement Project	
Wetlands	**Total Acreage**
Groundwater Seep Wetland	0.78
Seasonal Wetlands	0.09
Total Wetlands	**0.87**
Other Waters	**Total Acreage**
Perennial Streams	0.81
Ephemeral Streams	0.03
Flume	0.02
Ditch	0.02
Total Other Waters	**0.89**
TOTAL WATERS OF THE U.S.	**1.75**

The Groundwater Seep Wetland (GWS-1) feature (Figure 7) is dominated by canyon live oak [NL] and bay laurel [NL] in the tree layer; edible fig [FACU], spicebush [FAC] and poison oak [FACU] in the shrub layer; and Himalayan blackberry [FAC] in the woody vine layer.

The Seasonal Wetland (SW) features (Figures 7 and 8) tend to be dominated by Mediterranean barley *(Hordeum marinum ssp. gussoneanum)* [FAC], hyssop loosestrife *(Lythrum hyssopifolium)* [OBL], and annual hair grass *(Deschampsia donthonioides)* [FACW]. Common subdominants include Mediterranean beardgrass *(Polypogon maritimus)* [OBL], ryegrass *(Festuca perennis)* [FAC], purslane speedwell *(Veronica peregrina ssp. xalapensis)* [FAC] and Oregon woolly marbles *(Psilocarphus orgonus)* [OBL]. A number of these features (SW-2, SW-3, SW-4, SW-5, SW-6) may have been created and /or have been impacted by recent construction activities associated with a former construction staging area. Several of these features have a layer of small pea gravel covering the bottom of the depression.

Jurisdictional Considerations

The Perennial Stream features PS-1 and PS-2 (Figure 7), which include both North Fork Battle Creek and Digger Creek appear to meet the definition of a Relatively Permanent Water (RPW) as defined by the *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook* (U.S. Army Corps of Engineers and Environmental Protection Agency 2007) and the revised Rapanos / Carabell guidance (U.S. Army Corps of Engineers and Environmental Protection Agency 2008). The Groundwater Seep Wetland feature GSW-1 is likely jurisdictional as it is adjacent to an RPW.

The Ditch feature (Figure 7) may, or may not be jurisdictional as it is connected at the downstream end to North Fork Battle Creek by way of a waterfall over the vertical canyon wall, but it is ephemeral in nature and does not appear to be connected to a potentially jurisdictional feature at the upstream end. Ephemeral Stream features ES-1, ES-2, ES-3, ES-4, and ES-5 (Figures 5, 6, and 8) may, or may not be jurisdictional due to their ephemeral hydrology. The Flume feature (Figure 7) may be jurisdictional as it is connected to North Fork Battle Creek at the upstream end and eventually flows back to the South Fork Battle Creek at the downstream end. Seasonal Wetland features SW-2, SW-3, SW-4, SW-5, SW-6, and SW-7 (Figures 7 and 8) may, or may not be jurisdictional due to the fact that they appear to meet the definition of "isolated", they do not flow directly to an RPW, they do not abut an RPW and they do not appear to be adjacent to an RPW. Seasonal Wetland Feature SW-1 (Figure 8) may, or may not be jurisdictional due to the fact that it is associated with an ephemeral stream (feature ES-5).

ACKNOWLEDGEMENTS

We wish to thank the Davis Ranch, David Gamon and April Gage, and PG&E for allowing access to the project site to complete our work. We also wish to thank Michael Love and Associates for providing drone-collected rectified aerial photos that proved to be invaluable for mapping the inaccessible portions of waters and wetlands in the bottom of the remote vertical canyon. Funding for this work was provided by the USFWS under the authority of the Central Valley Project Improvement Act through Grant Agreement Award F18AP00099.

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APPENDIX A

Routine Wetland Delineation Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: Eagle Canyon | City/County: /Tehama | Sampling Date: 6/20/18
Applicant/Owner: USFWS / Davis Ranch | State: CA | Sampling Point: DP-1
Investigator(s): J. Souza / J. Dittes | Section, Township, Range: Section 25, Township 30 North, Range 1 West MDBM
Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): concave | Slope (%): 2
Subregion (LRR): MLRA 22B | Lat: 40° 25' 01.59" N | Long: -121° 55' 06.54" W | Datum: WGS 84
Soil Map Unit Name: Inks very cobbly sandy clay loam, 1 to 13 percent slopes (IcD) | NWI classification: PEM1C
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: **Small depression fed by seasonal stream, backed up by gravel road base.**

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: 0.5²)			
1. *Festuca perennis*	15	yes	FAC
2. *Plagiobothrys stipitatus*	15	yes	FACW
3. *Veronica peregrina*	5	no	FAC
4. *Polypogon maritimus*	2	no	OBL
5. *Polygonum aviculare*	2	no	FAC
6. *Poa annua*	1	no	FAC
7. *Plantago elongata*	t	no	FACW
8.			
50% = 20, 20% = 8	40	= Total Cover	
Woody Vine Stratum (Plot size: n/a)			
1.			
2.			
50% = ____, 20% = ____		= Total Cover	
% Bare Ground in Herb Stratum 55	% Cover of Biotic Crust 5		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species	2	x1 =	2
FACW species	15	x2 =	30
FAC species	23	x3 =	69
FACU species	0	x4 =	0
UPL species	0	x5 =	0
Column Totals:	40 (A)		101 (B)

Prevalence Index = B/A = 2.52

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: Battle Creek

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 -3/4"	5YR 3/3	100					Si. Loam	fine roots, organic matter depositional
3/4"-3"	5YR 3/4	80-90	2.5 YR 4/8	10-20	C	M/PL	Si. Loam	subangular/blocky, faint c
3"-11"	5YR 3/4	100					Si. Loam	Mn concretions / coatings abundant
11"+								Bedrock

[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: Bedrock

Depth (Inches): 11

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

Remarks: Soils are problematic hydric soil (seasonably punded soils). Inundation period too brief for development of redox features; indicators of hydrology and hydrophytic vegetation are present. Ponding may also be too recent for development of redox features.

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: Observations of saturation earlier in the spring of 2018.

Remarks: Basin fed by ephemeral streams and backed up / impounded by gravel road bed. Cattle hoof prints also present. FAC neutral is met 1:0.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: Eagle Canyon | City/County: ____ / Tehama | Sampling Date: 6/20/18

Applicant/Owner: USFWS / Davis Ranch | State: CA | Sampling Point: DP-2

Investigator(s): J. Souza / J. Dittes | Section, Township, Range: Section 25, Township 30 North, Range 1 West MDBM

Landform (hillslope, terrace, etc.): Swale | Local relief (concave, convex, none): convex | Slope (%): 5

Subregion (LRR): MLRA 22B | Lat: 40° 25' 01.45" N | Long: -121° 55' 06.62" W | Datum: WGS 84

Soil Map Unit Name: Inks very cobbly sandy clay loam, 1 to 13 percent slopes (IcD) | NWI classification: ____

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: **See paired seasonal wetland datapoint (DP-1); this point is within 3' of DP-1. This data point lacks hydrophytic vegetation, hydrology, and hydric soil.**

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: 0.5²)			
1. *Bromus hordaceous*	25	yes	FACU
2. *Festuca perennis*	20	yes	FAC
3. *Elymus caput-medusae*	15	yes	NL (UPL)
4. *Trifolium hirtum*	15	yes	NL (UPL)
5. *Festuca bromoides*	10	no	FACU
6. *Erodium botrys*	8	no	FACU
7. *Petrophagia dubia*	2	no	NL (UPL)
8. *Brodiaea sp.*	t	no	NL (UPL)
50% = 47.5, 20% = 19	95	= Total Cover	
Woody Vine Stratum (Plot size: n/a)			
1. ____	____	____	____
2. ____	____	____	____
50% = ____, 20% = ____	____	= Total Cover	

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

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	25	(A/B)

Prevalence Index worksheet:

	Total % Cover of :	Multiply by:	
OBL species	0	x1 =	0
FACW species	0	x2 =	0
FAC species	20	x3 =	60
FACU species	43	x4 =	172
UPL species	32	x5 =	160
Column Totals:	95 (A)		392 (B)

Prevalence Index = B/A = 4.12

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: Battle Creek

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 -6	5YR 3/3	100					Si. Loam	fine roots, sub angular blocky
6-10	5YR 3/4	95	Mn Concretion	5		M	Si. Loam	sub angular blocky
10-16	5YR 3/3	100					Si. Loam	sub angular 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: n/a

Depth (Inches): _____

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: There are no primary of secondary indicators of hydrology. This point is ~10" higher than DP-1. FAC Neutral not met 0:1.

APPENDIX B

Ordinary High Water Mark Datasheets

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Battle Creek Fish Passage
Project Number: 1713
Stream: Unnamed
Investigator(s): Jeff Souza, Lorin Mills

Date: 5/30/18 **Time:** 10:15
Town: Manton **State:** CA
Photo begin file#: **Photo end file#:**

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details: Eagle Canyon North bank access road.

Projection: **Datum:**
Coordinates:

Potential anthropogenic influences on the channel system:

Culvert/fill for access road

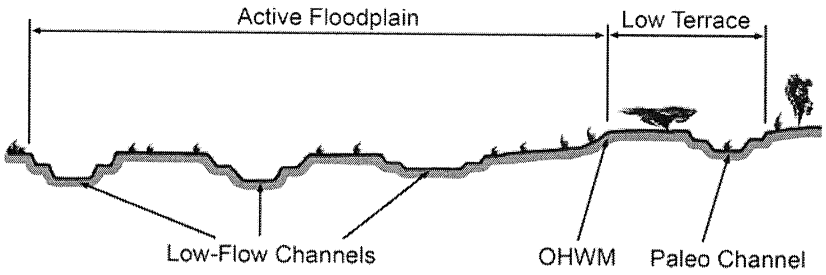
Brief site description:

Ephemeral creek just off of Battle Creek Bottom Road on acces to Eagle Canyon

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ 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

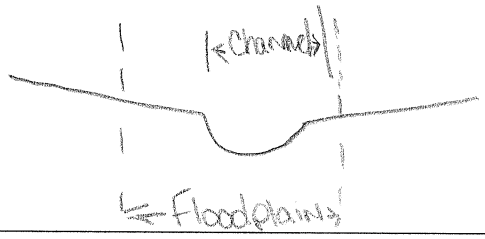


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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
   - ☒ GPS
   - ☐ Other:

Project ID: 1713 **Cross section ID:** ES-1 **Date:** 5/30/18 **Time:** 10:15

Cross section drawing:



OHWM

GPS point: ES-001

Indicators:

- [x] Change in average sediment texture
- [x] 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: ES-001 Cross Section 1

Characteristics of the floodplain unit:

Average sediment texture: Course Silt

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

Community successional stage:

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

Indicators:

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

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Battle Creek Fish Passage
Project Number: 1713
Stream: Unnamed
Investigator(s): Jeff Souza & Lorin Mills

Date: 5/30/18
Town: Manton
Photo begin file#:

Time: 10:30
State: CA
Photo end file#:

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

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

Location Details: Eagle Canyon north bank access road

Projection: **Datum:**
Coordinates:

Potential anthropogenic influences on the channel system:

Culverts, fill for road crossing.

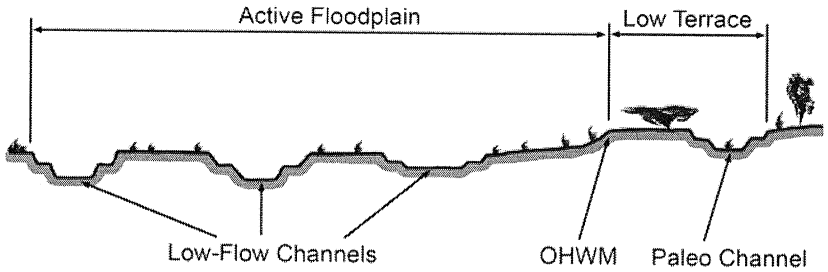
Brief site description:

Ephemeral creek just off of Battle Creek Bottom Road on access to Eagle Canyon.

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [ ] 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

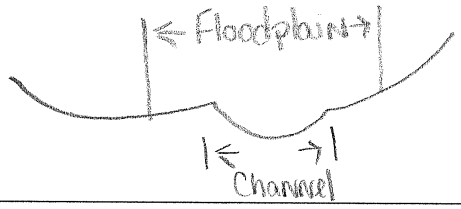


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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: MB **Cross section ID:** ES-2 **Date:** 5/30/18 **Time:**

Cross section drawing:



OHWM

GPS point: ES-002

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: ES-002 Cross Section

Characteristics of the floodplain unit:

Average sediment texture: Course Silt

Total veg cover: 100 % Tree: 100 % Shrub: 5 % Herb: 80 %

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
- [ ] Benches
- [ ] Soil development
- [x] Surface relief
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Battle Creek
Project Number: 1713
Stream: Unnamed
Investigator(s): Jeff Souza, Lorin Mills

Date: 5/30/18 **Time:** 11:30
Town: Manton **State:** CA
Photo begin file#: **Photo end file#:**

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details:

Projection: **Datum:**
Coordinates:

Potential anthropogenic influences on the channel system:

Culvert, Fill for access road.

Brief site description:

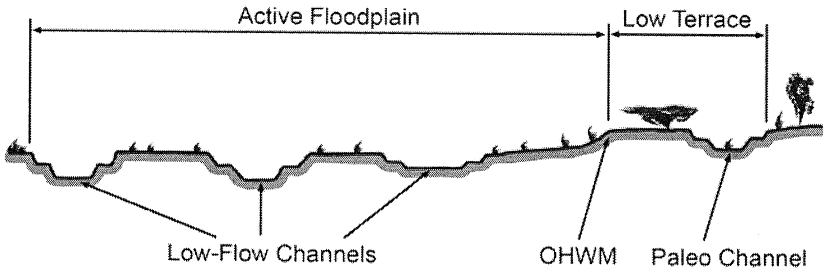
Ephemeral creek just off of Battle Creek Bottom Road on access to Eagle Canyon

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ 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

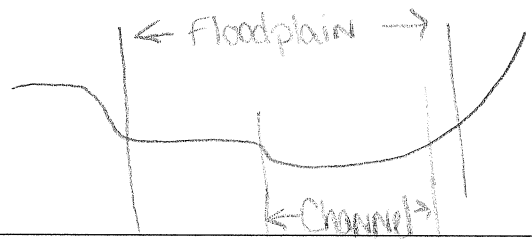


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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
   - ☒ GPS
   - ☐ Other:

Project ID: 1713 **Cross section ID:** ES-3 **Date:** 5/30/18 **Time:** 11:30

Cross section drawing:



OHWM

GPS point: ES-003

Indicators:

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

Comments:

Floodplain unit:

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

GPS point: ES-003 Cross Section

Characteristics of the floodplain unit:

Average sediment texture: Medium Sand

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

Community successional stage:

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

Indicators:

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

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Battle Creek Fish Passage
Project Number: 1713
Stream: Unnamed
Investigator(s): Jeff Souza, Lorin Mills

Date: 5/30/18 **Time:** 11:45
Town: **State:**
Photo begin file#: **Photo end file#:**

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details: Eagle Canyon North access road.

Projection: **Datum:**
Coordinates:

Potential anthropogenic influences on the channel system:

Culvert, fill for access road

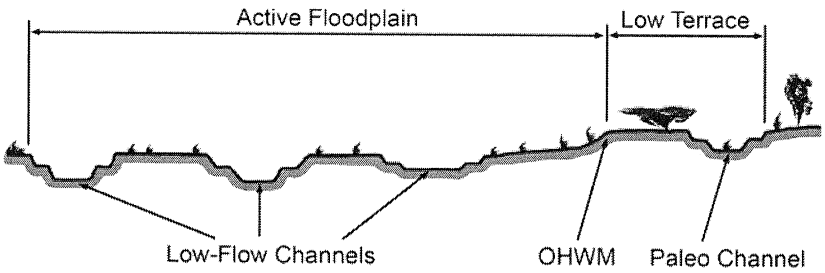
Brief site description:

Ephemeral creek just off of Battle Creek Bottom Road on access to North bank of Eagle Canyon.

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ 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

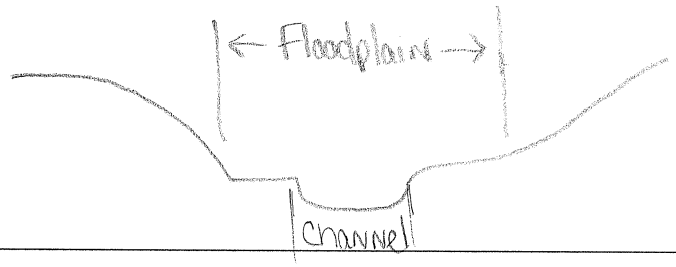


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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
   - ☒ GPS
   - ☐ Other:

Project ID: 1713 **Cross section ID:** ES-4 **Date:** 5/30/18 **Time:** 11:45

Cross section drawing:



OHWM

GPS point: ES-004

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: ES-004 Cross section

Characteristics of the floodplain unit:

Average sediment texture: Coarse sand

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

Community successional stage:

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

Indicators:

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

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Battle Creek Natural Barrier
Project Number: 1713
Stream: Unnamed
Investigator(s): Jeff Souza, John Dittes

Date: 6/20/18
Town: Manton
Photo begin file#:

Time:
State: CA
Photo end file#:

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☒ / N ☐ Is the site significantly disturbed?

Location Details: South Access Road

Projection: **Datum:**
Coordinates: 40.4170, -121.9184

Potential anthropogenic influences on the channel system:
Road crossing that has caused water to pool upstream, rock has been placed on road surface. Small rock dam ~30' downstream of road crossing.

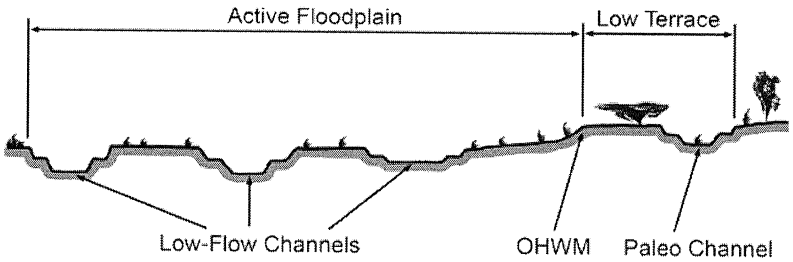
Brief site description:
Ephemeral stream that crosses south access road (ES-5).

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☒ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☒ Existing delineation(s) for site
- ☒ 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

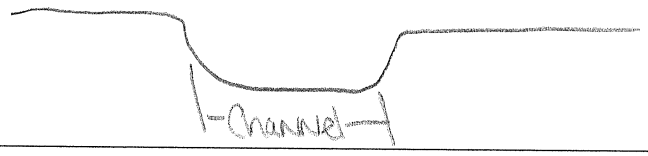


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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
   - ☒ GPS
   - ☐ Other:

Project ID: 1713 **Cross section ID:** ES-5 **Date:** 6/20/18 **Time:**

Cross section drawing:



OHWM

GPS point: File R0602009A

Indicators:

- ☐ Change in average sediment texture
- ☒ Change in vegetation species
- ☒ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

Small rock check dams upstream & downstream assumed for sediment control. No functional floodplain.

Floodplain unit:

☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

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

Comments:

APPENDIX C

Site Photos

Photo 1. View of Groundwater Seep Wetland Feature GSW-1, on the south bank canyon wall, looking southeast. The feature is composed of seeps and waterfalls. Photo date: August 22, 2018.

Photo 2. View of Perennial Stream feature PS-1, North Fork Battle Creek looking north. Photo date: May 30, 2018.

Photo 3. View of Wetland Delineation Data Points DP-1 (right white flag) and DP-2 (left white flag), located in the Seasonal Wetland feature SW-1, adjacent to the south access road, looking west. The pink flags represent the delineated wetland boundary. Photo date: June 20, 2018.

Photo 4. View of Ephemeral Stream feature ES-1, looking east. The pink flags represent the OHWM. Photo date: May 30, 2018.

Photo 5. View of Ephemeral Stream feature ES-2, looking west. The pink flags represent the OHWM. Photo date: May 30, 2018.

Photo 6. View of Ephemeral Stream feature ES-3, looking west. The pink flags represent the OHWM. Photo date: May 30, 2018.

Photo 7. View of Seasonal Wetland features SW-3, looking north. Photo date: June 20, 2018.

Photo 8. View of the PG&E flume and catwalk, looking east. Photo date: April 1, 2018.

Photo 9. View of Seasonal Wetland feature SW-6, looking north. The pink flags represent the delineated boundary. Photo date: June 20, 2018.