Aquatic Resources Delineation For the Reading Island Boat Ramp Project Shasta County, California February 1, 2024



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- Appendix A Wetland Delineation Map
- Appendix B Wetland Determination Data Form (available upon request)
- Appendix C Site Photographs
- Appendix D Rapid Ordinary High Water Mark Field Identification Data Sheet (form available upon request)

Summary

This Aquatic Resources Delineation Report was prepared to document the presence of wetlands and other waters of the U.S. that potentially fall within jurisdiction of the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act, as well as wetlands and waters of the State that potentially fall within jurisdiction of the Regional Water Quality Control Board under Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act. The aquatic resources delineation was conducted within an 11.3-acre study area by staff with the Sacramento River Forum on December 5, 2023, December 7, 2023, January 19, 2024, February 6, 2024 and February 28, 2024.

Methods followed the 1987 Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987) and the Arid West Regional Supplement to the Corps of Engineers Wetland Delineation Manual (U.S Army Corps of Engineers 2008) and adhere to the Minimum Standards for Acceptance of Preliminary Wetland Delineations (U.S. Army Corps of Engineers 2001). The wetland indicator status for plants follows the Arid West 2016 Regional Wetland Plant List (Lichvar et al. 2016). Potentially jurisdictional other waters of the U.S. were delineated in accordance with procedures described 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).

Within the study area, a total of 0.58 acres of potentially jurisdictional wetlands and 1.74 acres (1,230 linear feet) of potentially jurisdictional other waters of the U.S. were identified and mapped. The aquatic resources identified within the study area include forested riparian wetland, scrub-shrub riparian wetland, and a perennial stream (Sacramento River). These aquatic resources are regulated under Section 404 of the Clean Water Act and are also considered waters of the State. These figures are subject to U.S. Army Corps of Engineers verification.

Introduction

Purpose

The aquatic resources delineation was prepared as part of a planning and permitting effort to rehabilitate a currently decommissioned boating facility. The project is called the Reading Island Boat Ramp Improvement Project (proposed project). The project will include the installation of a prefabricated floating dock and gangplank for motorized boat access to Anderson Creek. In-stream sediment and vegetation will be excavated around the dock to allow for boat access. The ramp will be cleared of sediment to created a 2-foot wide shoulder on either side. A separate car-top boat launch area will be installed for non-motorized access to lower Anderson Creek. The adjacent parking lot will be restriped and shoulder improvements made to ease navigation. The boat ramp facility will allow boating access to Anderson Creek and the Sacramento River. Implementation funds have not yet been secured.

The proposed project may result in permanent and temporary impacts to wetlands and waters of the U.S. and primarily Project activities that impact aquatic resources in the study area may include filling of

wetlands, dredging, and filling and disposal of dredge wastes. It is anticipated that the project will require a 404 permit from the Corps of Engineers as well as a water quality certification from the Regional Water Quality Control Board (RWQCB).

Study Area Location

The study area is located within the Reading Island Recreation Area and a portion of Anderson Creek approximately 0.39 miles from its confluence with the Sacramento River in Shasta County, California. The Reading Island Recreation Area is owned by the Bureau of Land Management. The study area can be seen on the 'Balls Ferry' 7.5-Minute USGS Topographic Quadrangle and in Figures 1 and 2. The western edge of the study area follows near the centerline of Anderson Creek. The northern end of the study area overlaps the Adobe Road bridge. The southern end of the study area terminates about 100 feet south of the existing boat ramp to Anderson Creek.

Study Area size	11.3 acres
Study Area Center Coordinates (NAD 83)	Latitude: 40.39002194° N Longitude: -122.19752541° W
Study Area Center Coordinates (UTM)	UTM: 10N 568108 4471356
Public Land Survey System (PLSS)	Sections 3, 4, 9 and 10 of Township 29 North, Range 03 West MDB&M
USGS 7.5-Min Quadrangle Name	Balls Ferry, California

Table 1. Study Area Location Summary

Directions to the Site and Access Considerations

To reach the study area from 310 Hemsted Drive, Redding, take Interstate 5 south from Hemsted Drive and Bechelli Ln and proceed for 10 miles, take exit 667 from I-5 S for Factory Outlets Dr toward Deschutes Rd. Turn left onto Factory Outlets Dr. At the traffic circle, take the 1st exit onto Locust Street and proceed 0.8 miles, turn left onto Kimberly Rd/Locust St and proceed for 207 feet, turn right onto Panorama Point Rd and proceed for 2.5 miles, turn left onto Balls Ferry Rd and proceed for 0.6 miles, turn right onto Adobe Rd and proceed 0.6 miles, turn right onto Adobe Rd and proceed for 2.6 miles to the Reading Adobe parking area which is located within the study area.

Access to the study area is open to the public through a gate on Adobe Road which opens at sunrise and closes at around 5pm.



Figure 1. Vicinity Map of the Study Area



Figure 2. Aerial Photograph of the Study Area

Property Owner Information

Most of the study area is within the Reading Island Recreation Area which is owned by the Bureau of Land Management. A small portion of the study area encompasses the Adobe Road bridge which is owned by Shasta County.

Regulated Activities

Jurisdictional waters include wetlands and other waters of the U.S. (U.S. Army Corps of Engineers 2022; U.S. Environmental Protection Agency 2006), as well as waters of the State (California Water Resources Control Board 2019). All waters of the U.S. are assumed to also be waters of the State. Wetlands are areas inundated or saturated at a frequency and duration that supports a prevalence of vegetation associated with saturated soils. A jurisdictional wetland is dominated by hydrophytic (moisture-dependent) vegetation, has hydric (anaerobic) soil properties, and exhibits wetland hydrology (an appropriate timing, duration, and frequency of inundated or saturated conditions during the growing season; Environmental Laboratory 1987). Other waters of the U.S. exhibit a defined bed and bank and an OHWM. The OHWM is a mark on the shore created by fluctuating water and indicated by physical characteristics like a change in sediment character, slope, and vegetation. Jurisdictional other waters of the U.S. are based on the lateral limits of the OHWM.

Methods

Desktop Analysis

A desktop analysis was performed to both plan field surveys and to integrate and examine wetland and hydrological characteristics. Table 2 lists the remote sensing data used in this analysis which included aerial photography and LiDAR derived surface elevation data (OCM Partners 2022). Field data collection was evaluated against remote sensed data to refine field measurements and reduce GPS spatial errors.

Data Type	Date	Source	Notes
Aerial Photography	2024-01-02	Google	Recent, high resolution
			color aerial
			photography.
Aerial Photography	2001-07-19	U.S. Bureau of Land	Imagery taken during
		Management	Keswick Dam releases
			of 15,100 cfs
Aerial Photography	1980-06-10	U.S. Bureau of Land	Imagery taken during
		Management	Keswick Dam releases
			of 10,100 cfs
Aerial Photography	1974-01-21	NASA AMES Research	Imagery taken during
		Center	Keswick Dam releases
			of 61,300

Table 2. Remote sensing data used in desktop analysis.

Aerial Photography	1938	U.S. Department of	Earliest aerial
		Agriculture	photography available
Lidar	2019-10-11	OCM Partners	0.5 meter bare earth
			elevation raster
Topobathymetric and	2017-09-15	NOAA Fisheries (2017)	Data collected during
bare earth LiDAR			Keswick Dam releases
			of 8,980 cfs

Ordinary High Water Mark Determination

Delineation of the ordinary high water mark (OHWM) followed the National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams (U.S. Army Engineer Research and Development Center 2022). High resolution lidar was used to identify slope breaks that corresponded with a variety of flow regimes that left impressions on the banks such as slope breaks. A site visit on Feb 6, 2024 evaluated the height of Anderson Creek while flows in the Sacramento River were around 39,000 cfs (USGS 2024a, USGS 2024b, USGS 2024c). This was one day after the Sacramento River flows peaked at 65,600 cfs, which left ample evidence of the water height, including racking, drift deposits, erosion, and saturated soils. See **Appendix D - Rapid ordinary high water mark (OHWM) Field identification data sheet** and **Appendix E – OHWM Transect Report**.

Wetland Delineation

Fieldwork was conducted by Robert Irwin, a biologist with the Sacramento River Forum on December 5, 2023, December 7, 2023, January 19, 2024, February 6, 2024 and February 28, 2024. Data collection and evaluation followed the 1987 Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987) and the Arid West Regional Supplement to the Corps of Engineers Wetland Delineation Manual (U.S Army Corps of Engineers 2008). The wetland indicator status for plants follows the Arid West 2016 Regional Wetland Plant List (Lichvar et al. 2016). all vegetated areas within the OHWM were delineated as other waters of the U.S.

Environmental Setting

Study Area Description and Land Use

The 11.3 acre study area encompasses a portion of Anderson Creek and a portion of the Reading Island Recreation Area. The study area experiences a Mediterranean-type climate characterized by wet winters and dry summers. The vegetation types include annual grassland, valley oak woodland, riparian forest, and riverine habitat associated with Anderson Creek. The recreation facilities within the study area include a paved road and parking areas as well as a boat ramp.

Topography

The topography of the site is discussed here from assessing LiDAR derived surface elevations (USGS 2019). Elevations range from 349 to 374 feet across the study area. The topography of the site can be generally divided into three areas; Anderson Creek, an adjacent flood plain, and an upper terrace (see **Figure 3. Elevation Transect Plots** and **Figure 4. LiDAR Elevation Surface, Transects, and Contours**).

The mean surface of Anderson Creek during the LiDAR acquisition in 2019 was at 350 feet, while the adjacent floodplain elevation was about 361 feet. The upper terrace was approximately 366 feet in elevation. Additional information on the topography of the study area is provided in **Appendix E** – **OHWM Transect Report.**



Figure 3. Elevation Transect Plots



Figure 4. LiDAR Elevation Surface, Transects, and Contours

Hydrology

The dominant hydrological feature within the study area is the lower stretch of Anderson Creek, a perennial waterway, about 0.5 miles upstream of it's confluence with the Sacramento River. Anderson Creek's headwaters are located 2 miles west of the city of Anderson in Shasta County, California. Anderson Creek receives flows from

In December, 2019 a project, the Redding Island Side Channel Project (SPK-2016-00861), constructed a side channel at the northern end of Reading Island to allow Sacramento River flows into Anderson creek to provide habitat for juvenile Chinook salmon. This constructed side channel was designed to convey between 80 to 230 feet³/sec (cfs) of river flows into Anderson Creek. This connection with the river appears to be the main source of flows within Anderson Creek, which had been a relatively stagnant backwater prior to 2019.

Historically, Reading Island was an island within the Sacramento River as evidenced by USGS 1894 quadrangle maps (USGS 1894). By 1938, Reading Island was closed off from inflows from the Sacramento River at it's north end, resulting in a long backwater alcove which persisted until 2019 (USDA 1938).

For an overview of the hydrological connections surrounding the study area, refer to Figure 5. Generalized hydrological connections around Reading Island and Figure 6. National Hydrography Dataset Plus High Resolution near the Study Area.



Figure 5. Generalized hydrological connections around Reading Island



Figure 6. National Hydrography Dataset Plus High Resolution near the Study Area

Local Climate

Climate conditions at the site are Mediterranean with cool, wet winters and hot, dry summers. Daytime temperatures range from 19 degrees to 117 degrees Fahrenheit during the year (see **Figure 9. Daily Temperature Data for Redding, California in 2023-2024**). Annual precipitation (1996-2008) average is 33.68 inches, occurring mostly during the winter (see **Figure 10. Accumulated Precipitation data for the 2024 water year**).



Figure 7. Daily Temperature Data for Redding, California in 2023-2024



Figure 8. Accumulated Precipitation data for the 2024 water year

Geology and Soils

The study area is located within the Sacramento Valley, which encompasses the northern portion of the Great Valley Geomorphic Province. The surface geology within the study area is composed of Holoceneage alluvial and overbank deposits (Fraticelli et al. 2012). These surficial deposits are associated with the historic meander belt of the Sacramento River.

According to the USDA Web Soil Survey (Natural Resources Conservation Service 2024), two soil map units occur within the study area (see **Figure 9. Soil Types and Hydric Ratings Map**). These include Reiff fine sandy loam, 0 to 3 percent slopes (RgA), and Water (W). None of these soil types nor their minor components have a hydric status.



Figure 9. Soil Types and Hydric Ratings Map

Vegetation Communities

The vegetation within the study area was evaluated during site visits, and from current aerial photography, and by previous vegetation mapping of the area (California Department of Fish and Wildlife 2023). The vegetation types within study area and their total acreage is presented below in **Table 3. Habitat Types within the Study Area**. A map of these habitat types is presented in **Figure 9. Distribution of Habitat Types within the Study Area**. The characteristics of each habitat type and the associated wildlife species are discussed below.

Habitat Type	Acres	Percent
Annual Grasses and Forbs	2.9	25.7%
Valley Oak Woodland	3.0	26.5%
Riparian Mixed Hardwood	1.4	12.4%
Fremont Cottonwood	1.3	11.5%
Water	1.4	12.4%
Barren	1.3	11.5%

Table 3. Habitat Types within the Study Area

<u>Annual Grasses and Forbs</u>: This habitat type is found in the areas of the upper terrace west of the river. Plant species encountered include ripgut brome (*Bromus diandrus*), bulbous bluegrass (*Poa bulbosa*) with wild oat (*Avena fatua*), slender wild oat (*Avena barbata*), soft chess (*Bromus hordeaceus*), wall barley (*Hordeum murinum*) yellow star-thistle (*Centaurea solstitialis*), rose clover (*Trifolium hirtum*), , sky lupine (*Lupinus nanus*), and Q-tips (*Micropus californicus*).

<u>Valley Oak Woodland</u>: This habitat type is found on the upland terrace east of Anderson Creek. The valley oak savannah is dominated by large valley oaks (*Quercus lobata*) often with blue elderberry (*Sambucus cerulea*) in the shrub layer. The understory species of this habitat are similar to the annual grassland habits with the addition of coffeeberry (*Frangula californica*), fragrant sumac (*Rhus aromatica*), poison oak (*Toxicodendron diversilobum*), and California goldenrod (*Solidago velutina* ssp. *californica*).

<u>Riparian Mixed Hardwood</u>: Riparian forest trees include Fremont cottonwood (*Populus fremontii*), Oregon ash (*Fraxinus latifolia*), Northern California black walnut (*Juglans hindsii*), box elder (*Acer negundo* var. *californicum*), valley oak (*Quercus lobata*), black locust (*Robinia pseudoacacia*), white alder (*Alnus rhombifolia*), and arroyo willow (*Salix lasiolepis*), tree-of-heaven (*Ailanthus altissima*), and California button-willow (*Cephalanthus occidentalis* var. *californicus*). The riparian forest understory includes scouring horsetail (*Equisetum arvense*), Santa Barbara sedge (*Carex barbarae*), California greenbrier (*Smilax californica*), California manroot (*Marah fabacea*), and Himalayan Blackberry (*Rubus armeniacus*). Plant species found near the banks of Anderson Creek include Sandbar willow (*Salix exigua*) is frequently dominant in the shrub layer, with understory plants including reed canarygrass (*Phalaris arundinaceae*), pale smartweed (*Persicaria lapathifolia*), waterpepper (*Persicaria hydropiper*), South American vervain (*Verbena bonariensis*) yellow nutsedge (*Cyperus esculentus*), Pacific rush (*Juncus effusus* ssp. *pacificus*) and rice cutgrass (*Leersia oryzoides*).

<u>Fremont Cottonwood</u>: A grove of large Fremont cottonwood (*Populus fremontii*) cover approximately 1.3 acres within the center of the study area. The understory species are young valley oak (*Quercus*

lobata), blue elderberry (*Sambucus cerulea*) with patches of Himalayan Blackberry (*Rubus armeniacus*). Understory plants include annual grasses and California manroot (*Marah fabacea*), English Plantain (*Plantago lanceolata*), curly dock (*Rumex crispus*), poison hemlock (*Conium maculatum*), smilo grass (*Oloptum miliaceum*), bur chervil (*Anthriscus caucalis*), and common hedge parsley (*Torilis arvensis*).

<u>Water:</u> In slower moving water in Andesron Creek, dominant aquatic plants Montevidea waterweed (*Ludwigia peploides* ssp. montevidensis) and Amazon frogbit (*Limnobium laevigatum*).

<u>Barren</u>: These habitats include paved roads, parking areas, and a boat ramp with minimal vegetation cover.



Figure 10. Vegetation Types within the Study Area

Wetland Indicator Plants

A total of 78 plant species were identified within the study area that have a wetland indicator status according to the Arid West 2020 Regional Wetland Plant List (Lichvar et al. 2016) These plants are listed by indicator status and alphabetical order in **Table 4 Plant species found within the study area with wetland indicator status**.

Wetland Indicator Status	Species	Common Name
FAC	Artemisia douglasiana	California Mugwort
FAC	Carex barbarae	Santa Barbara Sedge
FAC	Clematis ligusticifolia	virgin's-bower
FAC	Echinochloa colona	Jungle-Rice
FAC	Equisetum arvense	Common Horsetail
FAC	Juglans hindsii	Northern California Black Walnut
FAC	Lepidium nitidum	shining peppergrass
FAC	Leymus triticoides	Creeping Wild Rye
FAC	Muhlenbergia rigens	Deergrass
FAC	Paspalum dilatatum	Dallisgrass
FAC	Phytolacca americana var. americana	American Pokeweed
FAC	Plantago lanceolata	English Plantain
FAC	Polygonum aviculare	Prostrate Knotweed
FAC	Populus fremontii	Fremont Cottonwood
FAC	Rosa californica	California Rose
FAC	Rubus armeniacus	Himalayan Blackberry
FAC	Rubus ursinus	California blackberry
FAC	Rumex crispus	Curly Dock
FAC	Setaria parviflora	Knotroot Bristlegrass
FACU	Ailanthus altissima	Tree-Of-Heaven
FACU	Ambrosia psilostachya	Western Ragweed
FACU	Bromus hordeaceus	Soft Chess
FACU	Cynodon dactylon	Bermuda-Grass
FACU	Elymus glaucus	Blue Wild Rye
FACU	Erigeron bonariensis	Flax-leaved Horseweed
FACU	Erodium botrys	Mediterranean Stork's-Bill
FACU	Hordeum murinum	wall barley
FACU	Hypericum perforatum	Common St. John's-Wort
FACU	Lactuca serriola	prickly lettuce
FACU	Marrubium vulgare	Horehound
FACU	Micropus californicus	Q-Tips
FACU	Mollugo verticillata	Green Carpetweed

Table 4. Plant species found within the study area with wetland indicator status

FACU	Poa bulbosa	bulbous bluegrass
FACU	Quercus lobata	Valley Oak
FACU	Rhus aromatica	Fragrant Sumac
FACU	Robinia pseudoacacia	Black Locust
FACU	Sambucus nigra ssp. caerulea	Blue Elder
FACU	Scleranthus annuus	Annual knawel
FACU	Solanum americanum	American Black Nightshade
FACU	Sorghum halepense	Johnson Grass
FACU	Toxicodendron diversilobum	Pacific Poison Oak
FACU	Verbascum thapsus	Woolly Mullein
FACU	Vitis californica	California Wild Grape
FACW	Acer negundo var. californicum	Box-Elder
FACW	Alnus rhombifolia	White Alder
FACW	Bidens frondosa	Devil's Beggarticks
FACW	Conium maculatum	Poison-Hemlock
FACW	Cyperus eragrostis	Tall Flatsedge
FACW	Cyperus esculentus	Yellow Nutsedge
FACW	Cyperus strigosus	Straw-colored Flatsedge
FACW	Epilobium ciliatum	Fringed Willowherb
FACW	Equisetum hyemale ssp. affine	Common Scouring-rush
FACW	Euthamia occidentalis	Western Goldenrod
FACW	Fraxinus latifolia	Oregon Ash
FACW	Helenium puberulum	Rosilla
FACW	Juncus effusus ssp. pacificus	Pacific Rush
FACW	Persicaria lapathifolia	Pale Smartweed
FACW	Phalaris arundinacea	Reed Canarygrass
FACW	Salix exigua	Sandbar Willow
FACW	Salix gooddingii	Goodding's Willow
FACW	Salix laevigata	Red Willow
FACW	Salix lasiolepis	Arroyo Willow
FACW	Verbena bonariensis	Purpletop Vervain
OBL	Cephalanthus occidentalis var. californicus	California Button-Willow
OBL	Iris pseudacorus	Yellow Water Iris
OBL	Leersia oryzoides	Rice Cutgrass
OBL	Ludwigia peploides ssp. montevidensis	Montevideo Waterweed
OBL	Mentha pulegium	Pennyroyal
OBL	Persicaria hydropiper	Waterpepper
OBL	Persicaria punctata	Dotted Knotweed
OBL	Salix melanopsis	Dusky Willlow
UPL	Acmispon americanus var. americanus	Spanish Clover
UPL	Cerastium glomeratum	sticky mouse-ear chickweed
UPL	Daucus carota	Queen Anne's Lace
UPL	Euphorbia maculata	Spotted Spurge

UPL	Lactuca saligna	Willowleaf Lettuce
UPL	Verbascum blattaria	Moth Mullein

National Wetlands Inventory

Based on the National Wetlands Inventory (NWI) classification system (USFWS 2023, Cowardin et al. 1979), the study area includes one wetland environment: riverine, which is found along Anderson Creek (see **Fig. 10**. **National Wetlands Inventory Mapping**).



Figure 11. National Wetlands Inventory Mapping

Results

Wetlands and Other Waters

The study area contains two aquatic resource types, labelled on the Waters of the U.S. Map in **Appendix A. Wetland Delineation Map** as: forested riparian wetland (FW) and Anderson Creek (AC). Table 6 provides a summary of the size and length of these aquatic resource types. Table 7 includes all aquatic resources that were delineated.

Data sheets can be found in **Appendix B. Wetland Determination Data Forms**. Site visit photos can be found in **Appendix C. Site Photographs**.

Name	Cowardin type code	Size (acres)	
	cowardin type code	512C (acr c3)	

Name	Cowardin type code	Size (acres)	Length (feet)
Forested Riparian Wetland (FW)	PFOA	0.58	1,295
Anderson Creek (AC-1)	R2UBH	1.74	1,230

Map Label	Name	Cowardin type code	Latitude, Longitude	Size (acres)	Length (feet)
AC-1	Anderson Creek	R2UBH	40.390093°N,	1.74	1,230
			-122.198251°W		
FW-1	Forested Riparian	PFOA	40.391347°N,	0.07	108
	Wetland		-122.197702°W		
FW-2	Forested Riparian	PFOA	40.390439°N,	0.37	936
	Wetland		-122.198056°W		
FW-3	Forested Riparian	PFOA	40.388849°N,	0.15	251
	Wetland		-122.198256°W		

Table 6. Waters of the U.S. found within the Study Area

Forested Riparian Wetlands (FW)

There are approximately 0.58 acres of forested riparian wetlands in the study area. These wetlands were classified under the Cowardin system as PFO1A: palustrine, forested, broad-leaved deciduous, temporarily flooded. Forested riparian wetlands were found in areas with alluvial soils adjacent to the Anderson Creek, generally about halfway up the bank in most cases. There were several areas where the riparian wetland extended past the top of the bank, where it's possible that subsurface water is available from slope breaks along the top Anderson creek's bank. The upper margin of the riparian wetlands was often dominated by arroyo willow (*Salix lasiolepis*) and Oregon ash (*Fraxinus latifolia*) with occasional box-elder (*Acer negundo* var. *californicum*), white alder (*Alnus rhombifolia*) and Fremont's cottonwood (*Populus fremontii*). The understory was often dominated by Himalayan blackberry (*Rubus armeniacus*) and Santa Barbara sedge (*Carex barbarae*) with scattered patches of common scouring-rush (*Equisetum hyemale* ssp. *affine*), California mugwort (*Artemisia douglasiana*), California pipevine (*Aristolochia californica*), California greenbrier (*Smilax californica*) and California blackberry (*Rubus ursinus*).

Anderson Creek (AC)

Approximately 1.74 acres of Anderson Creek was delineated within the study area. This feature is classified under the Cowardin system as R2UBH: riverine, lower perennial, unconsolidated bottom, permanently flooded. The extent of Anderson Creek within the study area is labeled on the Waters of the U.S. Delineation Map as "Anderson Creek". Vegetation at and below the OHWM consists of facultative upland, facultative, facultative wetland, and obligate shrub, tree, and herbaceous species. Dominant shrubs and trees along the creek banks include arroyo willow (*Salix exigua*) and white alder (*Alnus rhombifolia*). Dominant understory plants along the shoreline are inundation tolerant herbaceous plants including smartweed (*Persicaria lapathifolia*), dotted knotweed (*Persicaria punctata*), swamp smartweed (*Persicaria hydroperoides*), Pacific rush (*Juncus effusus* ssp. *pacificus*) and yellow nutsedge and tall flatsedge (*Cyperus eragrostis*).

Conclusion

Within the study area there are 0.58 acres of potentially jurisdictional wetlands and 1.74 acres (1,230 linear feet) of potentially jurisdictional other waters of the U.S. both of which are regulated under Section 404 of the Clean Water Act, and which are also considered waters of the State. These figures are subject to U.S. Army Corps of Engineers verification.

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Appendix A: Wetland Delineation Map



Appendix B: Wetland Determination Data Form (available upon request) Appendix C: Site Photographs

Site Photograph Report



Prepared by Rob Irwin Date: February 12, 2024

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Map of Site Photo Locations
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Map of Site Photo Locations

1A

Project Activity

Lat, Lon

40.391269, -122.19831

Caption View from Adobe Bridge looking south at the Forested Riparian Wetlands along the bank of Anderson Creek.



1A | date: 2023-12-07 | Keswick gague (csf): 5,060

1B

Project Activity

Lat, Lon

40.391243, -122.198307

Caption View from Adobe Bridge looking south at the Forested Riparian Wetlands along the bank of Anderson Creek.



1B | date: 2024-02-06 | Keswick gague (csf): 17,200

1C

Project Activity

Lat, Lon

40.391188, -122.198176

CaptionView from Adobe Bridge looking south at the Forested Riparian Wetlands along the
bank of Anderson Creek in late spring of 2023



1C | date: 2023-04-24 | Keswick gague (csf): 7,590

Project Activity

Lat, Lon 40.390602, -122.198102

Caption View of Forested Riparian Wetland with arryo willow (Salix lasiolepis) in the shrub layer

View location on a map <u>(link)</u>



2 | date: 2023-04-24 | Keswick gague (csf): 7,590

Project Activity

Lat, Lon

40.390715, -122.197993

Caption View of Forested Riparian Wetland with arroyo willow (Salix lasiolepis) in the shrub layer and Oregon ash (Fraxinus latifolia) in the overstory



3 | date: 2023-04-24 | Keswick gague (csf): 7,590

Project Activity

Lat, Lon 40.390115, -122.198084

Caption View of Forested Riparian Wetland



4 | date: 2023-04-24 | Keswick gague (csf): 7,590

Project Activity

Lat, Lon

40.389271, -122.197928

CaptionView of boat ramp to be improved by project. Anderson creek is in the background.The OHWM of Anderson Creek is approximately 10 feet into the forground.

View location on a map (link)



5 | date: 2023-04-24 | Keswick gague (csf): 7,590

Project Activity

Lat, Lon 40.388958, -122.198042

Caption Photograph taken on the OHWM which runs between the valley oak trees on the right, and the willows on the left. The boat ramp is in the background.

View location on a map (link)



6 | date: 2024-01-19 | Keswick gague (csf): 5,230

Project Activity

Lat, Lon

40.388743, -122.198181

Caption

Large Valley oaks (Quercus lobata) on the terrace above Anderson Creek.

View location on a map <u>(link)</u>



7 | date: 2023-04-24 | Keswick gague (csf): 7,590

Project Activity

Lat, Lon

40.390255, -122.197446

Caption View of annual grassland west of the paved roads through the study area.



8 | date: 2022-10-07 | Keswick gague (csf): 4,020

Project Activity

Lat, Lon

40.39025, -122.197043

Caption View of paved road to the boat ramp toward a grove of Fremont's cottonwood (Populus fremontii) and young valley oak (Quercus lobata).

View location on a map (link)



9 | date: 2022-10-07 | Keswick gague (csf): 4,020

Appendix D: Rapid Ordinary High Water Mark Field Identification Photos (data sheet available upon request)

Site Photo Log Report

Photo #1

Lat, Lon, Bearing

Caption

View of the OHWM along Anderson Creek's right bank north of the bridge. The OHWM is visible at the cut bank below the ornamental grass and above a strip of native tress and shrubs.

40.391253, 122.198204, 355 North

View location on a map (link)



Photo #1 | date: 2024-02-06

Lat, Lon, Bearing

40.391269, 122.19831, 165 South by east

Caption

View of Anderson Creek's left bank. The OHWM was determined to be at the top of the slope aboe the line of willows and alders and below the valley oaks.

View location on a map <u>(link)</u>



Photo #2 | date: 2023-12-07

Lat, Lon, Bearing

40.390197, 122.198076, 205 South southwest

Caption

Downstream view from Anderson Creek's left bank. The OHWM was determined to be along the top of this bank.

View location on a map <u>(link)</u>



Photo #3 | date: 2023-12-05

Lat, Lon, Bearing

Caption

40.389041, 122.198759, 66 East northeast

View from the right bank of Anderson Creek toward the boat ramp. The rusty stains visible on the boat ramp steel posts are near the height of the OHWM.

View location on a map <u>(link)</u>



Photo #4 | date: 2024-01-19



Lat, Lon, Bearing

Caption

40.386976, 122.198856, 97 East by south

View of the left bank of Anderson Creek. The OHWM was determined to be above the lower third of the of the slope, below the valley oaks (Quercus lobata) and above the arroyo willow shrubs (Salix lasiolepis). A transition in the herbaceous vegetation is also apparent.

View location on a map (link)



Photo #5 | date: 2024-01-19

Lat, Lon, Bearing

Caption

40.384816, 122.198342, 347 North by west

Upstream view of Anderson Creek's right bank, 118 feet upstream of its confluence with the Sacramento River. The OHWM is located approximately above the herbaceous vegetation and below the valley oaks.

View location on a map (link)



Photo #6 | date: 2023-12-05