

# Appendix C

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## Aquatic Resources Delineation Report

DRAFT

**Aquatic Resources Delineation Report for the Cloverdale Unified  
School District South Fields Project, Sonoma County, California**

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# Acronyms and Abbreviations

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Acronym/Abbreviation	Definition
APN	Assessor's Parcel Number
APT	Antecedent Precipitation Tool
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
CNPS	California Native Plant Society
CWA	Clean Water Act
ED	Ephemeral drainage
FAC	Facultative
FACW	Facultative Wetland
ID	Intermittent drainage
MLRA	Major land resource area
MSL	Mean sea level
NL	Not Listed
NWI	National Wetlands Inventory
OBL	Obligate
OHWM	ordinary high water mark
RWQCB	Regional Water Quality Control Board
SWS	Seasonal wetland swale
TNW	traditionally navigable water
TOB	top of bank
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USGS	United States Geological Survey
UPL	Upland
WRCC	Western Regional Climate Center

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# 1 Executive Summary

This Aquatic Resources Delineation Report (report) was prepared in accordance with the U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual (USACE 1987), the Regional Supplement to the Wetland Delineation Manual: Arid West Region (USACE 2008a), and the Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region (USACE 2008b). Dudek conducted a field delineation in November 2020 to identify aquatic resources in the approximately 17.2-acre study area potentially subject to agency jurisdiction pursuant to regulations in Sections 401 and 404 of the Clean Water Act (CWA), Porter-Cologne Water Quality Control Act, and Section 1602 of the California Fish and Game Code. Table 1 summarizes the delineation findings. Potential jurisdiction discussed in Section 6, Conclusions, is preliminary until verified by the USACE San Francisco District.

**Table 1. Summary of Aquatic Resources in the Study Area**

Feature ID	Cowardin Code <sup>1</sup>	Acres <sup>2</sup>	Linear Feet
<b><i>Non-Wetland Waters</i></b>			
Ephemeral Drainages	R6	0.05	405
Intermittent Drainages (below TOB <sup>3</sup> )	R4	0.96	2,421
Seasonal Wetland Swales	R6	0.03	265
<b>Total Non-Wetland Waters</b>		<b>1.04</b>	<b>3,091</b>
<b><i>Other Aquatic Resources</i></b>			
Edge of Riparian	—	1.02	—
<b>Total Other Aquatic Resources</b>		<b>1.02</b>	<b>—</b>
<b>Total<sup>4</sup></b>		<b>2.06</b>	<b>3,091</b>

**Source:** USFWS 2013.

<sup>1</sup> R6 = riverine, ephemeral; R4 = riverine, intermittent

<sup>2</sup> Acreage of the non-wetland waters extend to top of bank or ordinary high water mark, whichever is furthest.

<sup>3</sup> TOB=Top of Bank

<sup>4</sup> Minor discrepancies in totals are the result of rounding differences between Excel and ArcMap.

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# 2 Introduction

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This report documents the methods and results of a preliminary delineation of potentially jurisdictional aquatic resources within the approximate 17.2-acre study area for the Cloverdale Unified School District South Fields Project (“project”) in Sonoma County, California (Figure 1, Project Location). The results of this delineation are preliminary until verified by the San Francisco District of USACE.

## 2.1 Project Description

The project would construct athletic fields on a portion of a vacant property at the south end of the City of Cloverdale. The project is proposed by the Cloverdale Unified School District (District) to develop a sports field complex that would support existing District athletic programs and allow community use outside of school hours. The sports fields would include a joint purpose baseball/soccer field and a joint purpose softball/soccer field located in the eastern portion of the site extending from the northern property boundary through the center of the property; a dog park would be established in the western portion of the site near the northern property boundary; and a parking lot, concession stand, and restrooms would be constructed in the eastern portion of the site near the southern property boundary. Pedestrian/maintenance pathways are also proposed for the site.

The proposed project would include installing storm drain lines beneath the athletic fields and piping the existing intermittent drainages that cross the project property. Stormwater runoff would be treated before entering the intermittent drainage south of the fields through an outfall. Water and sewer lines would be extended from Dutcher Creek Road/South Cloverdale Boulevard either along the northerly property boundary or through the southern portion of the property and the adjacent undeveloped parcel.

Access to the athletic fields would be provided by creation of a public roadway extending westerly from South Cloverdale Boulevard. The road on the north side of the project site, currently signed as Kelly Road, would be widened and paved as a public City of Cloverdale roadway. This work would be completed as part of development of the Baumgardner Ranch project immediately north of the Cloverdale South Fields project site. Similarly, the road on the south side of the project site, which is also currently signed as Kelly Road, is expected to be widened and paved as a public City of Cloverdale roadway as part of an anticipated development on the property immediately south.

Construction of the proposed project is anticipated to occur during daylight hours from Monday through Friday, between approximately August 2021 and June 2022. Construction activities are expected to include:

- Vegetation clearing and grubbing – Summer/Autumn 2021. Cleared and grubbed vegetation would be removed and disposed of off-site.
- Rough grading, utility line trenching, utility line installation - Summer/Autumn 2021. The area with the deepest soil cuts would be near the northwest corner of the athletic fields, with cuts up to approximately 6 feet. The maximum fills would be up to approximately 12 feet and would occur in the southeast portion of the fields. Grading is expected to balance onsite; no soil import or export needed. Utility line would be routed easterly through the adjacent property or southerly to Kelly Road and then east to Dutcher Creek Road.
- Final grading– Summer/Autumn 2021 Final grading to ensure level fields and appropriate slopes for drainage would be completed.
- Paving and construction – Spring 2022. To include paving parking lot, pouring foundation for concession stand and restroom, and constructing concession stand and restroom facility.

- Field surfacing/final improvements – Spring 2022. Installation of natural turf, fencing, dugout/players benches, and landscaping]

The Project would require the removal of one large oak tree located within the easterly of the two proposed fields, as well as several smaller trees within and adjacent to the ephemeral and intermittent drainages within the project site. The project proposes to provide natural turf landscaping for all athletic fields, and to revegetate areas that are disturbed during grading.

Construction equipment and materials would be staged within the project property during construction. Staging areas would be located within areas proposed to be graded or in other portions of the project property that are at least 50 feet from any intermittent or ephemeral drainage and outside of the dripline of any existing trees that are not proposed to be removed from the site. After construction, any materials not used or reused in the proposed project would be hauled off-site and reused or disposed of in a landfill or recycled at a recycling facility.

The proposed project would be required to comply with the requirements of the National Pollutant Discharge Elimination System (NPDES) permit and required to prepare and implement a Stormwater Pollution Prevention Plan (SWPPP). The proposed project would also implement commonly used best management practices for erosion control, including fiber wattles and silt fencing, covering exposed soil piles, and mulching disturbed areas during construction.

## 2.2 Project Location

The project would develop approximately nine acres (“project footprint”) of the 31-acre property owned by the District (Assessor’s Parcel Number 117-040-055) located on South Cloverdale Boulevard (Figure 1, Project Location). The 31-acre property includes the approximate 17.2-acre study area plus adjacent lands owned by the District to the west, south, and east. The study area is located in Sections 29 and 30 of Township 11 North and Range 10 West (Mt. Diablo Base and Meridian) within the Cloverdale U.S. Geological Survey (USGS) 7.5-minute quadrangle (Figure 2, Study Area). The approximate center of the study area corresponds to 38° 46' 39.6192" latitude and - 123° 0' 37.062" longitude.

## 2.3 Directions to the Study Area

From U.S. Highway 101 North, take Exit 518 toward Dutcher Creek Road. Turn left onto Teresa Road, and then turn right onto Dutcher Creek Road. Follow Dutcher Creek Road for approximately one mile, then turn left onto Kelly Road. The study area will be located on your right in approximately 500 feet and may be accessed from Kelly Road.

# 3 Regulatory Setting

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## 3.1 Federal

### 3.1.1 U.S. Army Corps of Engineers

Under Section 404 of the CWA, USACE regulates activities that involve a discharge of dredged or fill material, including grading, placing riprap for erosion control, pouring concrete, laying sod, and stockpiling excavated material, into waters of the United States. Activities that generally do not involve a regulated discharge (if performed specifically in a manner to avoid discharges) include driving pilings, providing some drainage channel maintenance activities, and excavating without stockpiling. Any person or public agency proposing to discharge dredged or fill material into waters of the United States, including jurisdictional wetlands, must obtain a permit from USACE.

Wetlands are “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR 328.3). USACE predominantly uses methodology defined in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (USACE 2010), or Arid West Region (USACE 2008a) to determine the presence of jurisdictional wetlands in California. According to the manuals (USACE 2008a, 2010), three criteria must be satisfied to classify an area as a wetland: (1) a predominance of plant life that is adapted to life in wet conditions (hydrophytic vegetation); (2) soils that saturate, flood, or pond long enough during the growing season to develop anaerobic conditions in the upper part (hydric soils); and (3) permanent or periodic inundation or soils saturation, at least seasonally (wetland hydrology).

For linear waters of the United States (e.g., perennial, intermittent, or ephemeral drainages), the lateral limits of USACE jurisdiction extend to the OHWM when no adjacent wetlands are present. As defined in the Code of Federal Regulations (CFR) Title 33, Section 328.3(e), the OHWM is “that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.” If adjacent wetlands are present, the jurisdiction extends to the limit of these wetlands. Further guidance for determining jurisdictional limits in riverine systems in California is detailed in A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (USACE 2008b) or A Guide to Ordinary High Water Mark (OHWM) Delineation for Non-Perennial Streams in the Western Mountains, Valleys, and Coast Region of the United States (USACE 2014).

#### 3.1.1.1 New Navigable Waters Rule

On January 23, 2020, USACE and the U.S. Environmental Protection Agency finalized the Navigable Waters Protection Rule, which established a new definition of waters of the United States under the CWA. The revised Navigable Waters Protection Rule redefining waters of the United States was published in the Federal Register on April 21, 2020 and became effective on June 22, 2020.

The new Navigable Waters Protection Rule repealed the Obama-era 2015 CWA and replaced it with a definition that limits the scope of federal regulation to a much narrower collection of aquatic resource features. Among the greatest changes, the Navigable Waters Protection Rule eliminates “significant nexus” determinations to determine



if potential tributaries have a significant effect on the “chemical, physical, and biological integrity of downstream traditional navigable waters.” The Navigable Waters Protection Rule also redefines the term “adjacent.” Now, for an adjacent wetland to be jurisdictional, it must touch “at least one point or side of a jurisdictional water” or have a direct hydrological surface connection to a traditional navigable waterway (TNW). Hydrological connections through groundwater, which have been suggested to maintain federal jurisdiction in the past, are now outside the scope of federal purview.

Most importantly, the Navigable Waters Protection Rule identifies four categories of aquatic resource features that are regulated by the federal government under the CWA, leaving oversight for other “excluded” waterbodies to states and tribes. The four categories of aquatic resources subject to federal regulation are the following: (1) territorial seas and traditional navigable waters; (2) perennial and intermittent tributaries; (3) certain lakes, ponds, and impoundments; and (4) wetlands that are adjacent to jurisdictional waters. The revised Navigable Waters Protection Rule does not expand federal regulation to include new categories of aquatic features; however, it does provide a list of excluded features that are no longer considered waters of the United States under the final Navigable Waters Protection Rule. Most significantly, “ephemeral” streams and other features that only flow in direct response to precipitation, and are particularly prevalent in the western United States, are no longer subject to CWA regulation.

## 3.2 State

### 3.2.1 California Department of Fish and Wildlife

Pursuant to Section 1602 of the California Fish and Game Code, the California Department of Fish and Wildlife (CDFW) regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or other aquatic wildlife.

In Title 14 of the California Code of Regulations, Section 1.56, CDFW’s definition of “lake” includes “natural lakes or man-made reservoirs.” Diversion, obstruction, or change to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or other aquatic wildlife requires authorization from CDFW by entering into an agreement pursuant to Section 1602 of the California Fish and Game Code.

In Title 14 of the California Code of Regulations, Section 1.72, CDFW defines a “stream” as “a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation.”

### 3.2.2 Regional Water Quality Control Board

Under Section 401 of the CWA, a water quality certification or waiver is required for activities authorized by a federal permit, including Section 404 permitted actions. The Regional Water Quality Control Board (RWQCB) oversees the 401 water quality certification program in California. When applicable, the RWQCB certifies “there is reasonable assurance that an activity that may result in a discharge to waters of the United States will not violate water quality standards.” The certification is based on the finding that the proposed discharge will comply with applicable state water quality standards.

Additionally, pursuant to provisions of the Porter-Cologne Water Quality Act, the RWQCB regulates discharging waste, or proposing to discharge waste, within any region that could affect a water of the state (California Water

Code Section 13260[a]). The State Water Resources Control Board defines a water of the state as “any surface water or groundwater, including saline waters, within the boundaries of the state” (California Water Code Section 13050[e]). As of April 2019, the State Water Resources Control Board has added a definition of wetland waters of the state, and the definition includes the following (SWRCB 2019):

1. Natural wetlands,
2. Wetlands created by modification of a surface water of the state,
3. Artificial wetlands that meet any of the following criteria:
  - a. Approved by an agency as compensatory mitigation for impacts to other waters of the state, except where the approving agency explicitly identifies the mitigation as being of limited duration;
  - b. Specifically identified in a water quality control plan as a wetland or other water of the state;
  - c. Resulted from historic human activity, is not subject to ongoing operation and maintenance, and has become a relatively permanent part of the natural landscape; or
  - d. Greater than or equal to one acre in size unless the artificial wetland was constructed and is currently used and maintained, primarily for one or more of the following purposes: industrial or municipal wastewater treatment or disposal; settling of sediment; detention, retention, infiltration, or treatment of stormwater runoff and other pollutants or runoff subject to regulation under a municipal, construction, or industrial permitting program; treatment of surface waters; agricultural crop irrigation or stock watering; fire suppression; industrial processing or cooling water; active surface mining – even if the site is managed for interim wetlands functions and values; log storage; treatment, storage, or distribution of recycled water; maximizing groundwater recharge (this does not include wetlands that have incidental groundwater recharge benefits); or fields flooded for rice growing.

All waters of the United States are waters of the state. Wetlands, such as isolated seasonal wetlands, that are not generally considered waters of the United States are considered waters of the state if, “under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area’s vegetation is dominated by hydrophytes or the area lacks vegetation” (SWRCB 2019).

Before USACE will issue a CWA Section 404 permit, applicants must receive a CWA Section 401 Water Quality Certification from the RWQCB. If a CWA Section 404 permit is not required for the project, the RWQCB may still require a permit for impacts to waters of the state under the Porter-Cologne Water Quality Act.

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# 4 Methodology

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## 4.1 Desktop Analysis

Prior to conducting fieldwork, Dudek biologist Anna Godinho reviewed the following sources to identify portions of the study area with a probability for containing potential jurisdictional aquatic resources:

- Google Earth current and historical aerial imagery (Google Earth 2021)
- USDA Natural Resources Conservation Service Web Soil Survey (USDA 2021b)
- U.S. Fish and Wildlife Service National Wetlands Inventory (NWI) Mapper (USFWS 2021)
- USGS National Hydrography Dataset (USGS 2021)

## 4.2 Field Delineation

Ms. Godinho conducted a preliminary aquatic resources delineation of the 17.2-acre study area on November 24, 2020 and May 11, 2021. Potential aquatic resources were delineated based on methodology described in the USACE Wetlands Delineation Manual (USACE 1987) and the Regional Supplement for the Arid West Region (USACE 2008a). Non-wetland waters of the United States or state were delineated based on the presence of an OHWM, as determined using the methodology in the OHWM Field Guide for the Arid West Region (USACE 2008b). Representative photographs are included in Attachment A.

All plant species encountered were identified to the lowest taxonomic level needed to determine wetland plant indicator status. Those species that could not be immediately identified were brought into the laboratory for further investigation. Latin names follow the Jepson Interchange List of Currently Accepted Names of Native and Naturalized Plants of California (Jepson Flora Project 2021), and common names follow the U.S. Department of Agriculture Natural Resources Conservation Service PLANTS Database (USDA 2021a). Wetland plant indicator status for each plant was determined using the Arid West 2018 Regional Wetland Plant List (USACE 2018). Attachment B contains a complete list of plant species observed during the field delineation.

Data at representative stream transects were collected on standardized OHWM data forms to assess channel hydrology and geomorphology (see details in Section 4.4, Wetland Indicator Assessment). OHWM data forms are included in this report as Attachment C. Stream transects were recorded in the field using a Trimble R1 GNSS Receiver with sub-meter accuracy and ArcGIS Collector app for iOS. Results of the stream transect analyses are presented in Section 5.3, Aquatic Resources Data Summary.

## 4.3 Wetland Indicator Assessment

Pursuant to the USACE 1987 Manual and 2008 Regional Supplement, key explicit environmental criteria for determining the presence of potential jurisdictional aquatic resources in the study area are as follows:

- **Soil:** Soil characteristics that result from the influence of periodic or permanent inundation or soil saturation for extended periods that further affect anaerobic conditions (i.e., chemical reduction in the soils or hydric soils).
- **Hydrology:** The presence of inundated or saturated soil conditions resulting from permanent or periodic inundation by groundwater or surface water.

- **Vegetation:** A prevalence of vegetation typically adapted for life in saturated soil conditions (i.e., hydrophytic vegetation).

Positive indicators of all three parameters are normally present in wetlands. Presence of primary and secondary wetland hydrology indicators were evaluated for each identified aquatic resource feature in the study area. Potential jurisdictional wetlands exhibiting atypical conditions were delineated in accordance with the 2008 Regional Supplement for situations involving vegetation, soil, and hydrology that may be naturally problematic and/or significantly disturbed.

## 4.4 Ordinary High Water Mark Assessment

The OHWM Field Guide (USACE 2008b) was used to provide technical guidance for delineating the OHWM, which is based on the physical and biological signatures established and maintained at the boundaries of an active channel. The OHWM Field Guide addresses the underlying hydrologic and geomorphic concepts pertaining to the OHWM and the field indicators, methods, and additional lines of evidence used to assess and delineate the OHWM. Delineation of the active channel signature (i.e., the OHWM) is based largely on identification of three primary physical or biological indicators (USACE 2008b):

- Topographic break in slope
- Change in sediment characteristics
- Change in vegetation characteristics (species or cover)

# 5 Results

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## 5.1 Environmental Setting

The study area is located on undeveloped District-owned land located in the County of Sonoma and is also within the City of Cloverdale Sphere of Influence and Urban Growth Boundary. The eastern portion of the site contains gently sloping non-native grassland with a large individual Valley oak (*Quercus lobata*) as well as drainages that support mixed oak woodland and coyote brush (*Baccharis pilularis*) scrub. The western portion of the site contains rolling hills that support blue oak (*Q. douglasii*) woodland. The study area was being grazed as a horse pasture at the time of both field surveys.

The study area is bounded to the north and south by unpaved roadways. The property immediately north of the study area contains a single-family residence, various outbuildings, and a barn. That property has recently been approved for a residential development called Baumgardner Ranch. The property to the northeast is currently being developed as the Sonoma County Vintners Co-op. There is a Payless storage facility adjacent to the northeastern corner of the site and, further east, a Renner Petroleum gas station fronting South Cloverdale Boulevard.

### 5.1.1 Climate and Rainfall

The study area is located in a semi-arid climate where average annual temperatures range from approximately 47°F to 74°F, and the average annual precipitation is 43.85 inches. On average, the months with the highest rainfall are December and January, and July has the least precipitation (WRCC 2021).

The USACE Antecedent Precipitation Tool (APT) was used to assess the amount of precipitation received in the study area during the delineation period (USACE 2021). The tool calculated that the coordinates of the geographic center of the study area experienced, on average, drier than normal antecedent precipitation conditions (below 30-Year Normal Range) during the period between November 24, 2020 and May 11, 2021, during which the delineation was conducted. The complete results of the APT query can be found in Attachment D.

### 5.1.2 Topography and Soils

The study area is located in the Alexander Valley on the west side of the Russian River. Elevations within the study area range from approximately 320 feet above mean sea level (MSL) in the southeast, to approximately 400 feet above MSL in the southwest. Topography in the study area is gently sloping downhill from the west to the east.

The Natural Resources Conservation Service (USDA 2021b) maps three soil units in the study area: Clear Lake Clay, drained, 2 to 5 percent slopes, MLRA 14; Positas gravelly loam, 0-9 percent slopes; and Suther loam, 30 to 50 percent slopes. Each soil unit, its proportion of hydric soils, drainage class (i.e., frequency and duration of wet periods in conditions similar to those in which it was developed), and typical landform or geomorphic position within the landscape is detailed in Table 2, Summary of Soil Units in the Project Study Area below. Figure 3, Project Soils, provides the geographic extent of each soil unit in the study area (USDA 2021b).

The National Technical Committee for Hydric Soils defines *hydric soils* as “soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part” (USDA 2021b). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

**Table 2. Summary of Soil Units in the Project Study Area**

Soil Map Unit Name	Landform	Drainage Class	Hydric
Clear Lake Clay, drained, 2 to 5 percent slopes, MLRA 14	Alluvial fans/toeslope, basin floors, drainageways	Poorly-drained	Yes
Positas gravelly loam, 0-9 percent slopes	Terraces/backslope	Well drained	No
Suther loam, 30 to 50 percent slopes	Hills/backslope	Moderately well drained	No

Source: USDA 2021b.

### 5.1.3 Watershed and Hydrology

The study area is within the Gill Creek-Russian River subwatershed (Hydrologic Unit Code 180101100602; Figure 4, Hydrologic Setting) of the greater Middle Russian River watershed, which drains approximately 185 square miles of Alexander Valley (CDFW 2021).

Since the study area is currently undeveloped and has not been disturbed by grading or other ground-disturbing activities, hydrology within the study area is relatively undisturbed. One intermittent drainage originates to the southwest of the study area and flows in an easterly direction into another intermittent drainage that originates to the north of the study area. Two seasonal wetland swales and two ephemeral drainages convey flows in an easterly direction into the easternmost intermittent drainage, which exits the study area at the southeast corner, and flows via a ditch to Icaria Creek, a tributary to the Russian River.

The USFWS (2019) and the USGS (2019) do not identify any waters of the U.S. or state, including wetlands, in or adjacent to the study area. However, these datasets are mapped at a coarse scale, providing reconnaissance-level data on the presence, location, and size of waters.

### 5.1.4 Vegetation Communities and Other Land Cover Types

The study area consists of a combination of terrestrial and aquatic vegetation communities and land cover types. The following vegetation communities were documented onsite and are described in further detail later in this section: Non-native grassland, mixed oak forest and woodland, blue oak woodland, and coyote brush scrub. Refer to Attachment A for representative photographs of onsite vegetation communities and land cover types. The vegetation communities and land covers have been adapted from the CDFW Natural Communities List (CDFW 2020) and Manual of California Vegetation, Online Edition (CNPS 2021).

#### 5.1.4.1 Natural Vegetation Communities

**Non-Native Grassland.** This vegetation community comprises the majority of the study area (13.61 acres) and was being used as a horse pasture during both field surveys. The heavily grazed vegetation was difficult to identify during the November 24, 2021 survey. Where identifiable, this landcover was dominated by a mix of non-native grasses including slender oat (*Avena barbata*), soft brome (*Bromus hordeaceus*), and medusahead (*Elymus caput-medusae*), and hayfield tarplant (*Hemizonia congesta*). During the May 11, 2021 field survey this community included more non-native forbs, including Italian thistle (*Carduus pycnocephalus*), German chamomile (*Matricaria chamomilla*), and rough cat's ear (*Hypochaeris radicata*), among others.

**71.100.00 Mixed Oak Forest and Woodland Alliance.** California live oak (*Q. agrifolia*), blue oak, black oak (*Q. kelloggii*), Valley oak, and/or interior live oak (*Q. wislizeni*) are co-dominant in the tree canopy with California buckeye (*Aesculus californica*), Pacific madrone (*Arbutus menziesii*), California Foothill pine (*Pinus sabiniana*), and California bay laurel (*Umbellularia californica*) (CNPS 2021). The membership rule for this alliance is as follows: Three or more *Quercus* species present at > 30% constancy and they are co-dominant in the tree canopy (CNPS 2021). Tree canopy is intermittent to continuous, less than 30 meters in height, and may be two tiered. Shrubs are infrequent to common; herbaceous layer is sparse to abundant and may be grassy. This alliance occurs in valleys and gentle to steep slopes. Soils are moderately deep.

Within the study area, this community comprises the riparian corridor associated with the intermittent drainages (1.78 acres). The sub-canopy/shrub layers are comprised of arroyo willow (*Salix lasiolepis*), Fremont's cottonwood (*Populus fremontii*), blue elderberry (*Sambucus nigra* ssp. *cerulea*), and Himalayan blackberry (*Rubus armeniacus*). The extent of this community was mapped to the edge of the tree canopy (see edge of riparian on Figure 4, Aquatic Resources).

**71.020.00 Blue Oak Woodland and Forest.** Blue oak or hybrid oak (*Q. × eplingii*) is dominant or co-dominant in the tree canopy with California buckeye, California foothill pine, California live oak, Valley oak, and interior live oak (CNPS 2021). The membership rule for this alliance is as follows: blue oak > 50% relative cover in the tree canopy; other hardwoods or conifers may be < 30% relative cover in the tree canopy (CNPS 2021). Tree canopy is intermittent to continuous or savanna-like, and up to 20 meters in height or 25 meters in height with conifers. Shrub layer is sparse to intermittent, and herbaceous layer is sparse or grassy with seasonally present forbs. This alliance occurs in valley bottoms, foothills, and rocky outcrops. Soils are shallow, low in fertility, moderately to excessively drained with extensive rock fragments.

Within the study area, this community occurs within 1.55 acres along the western boundary and becomes denser as it ascends the hill. The shrub layer is dominated by common manzanita (*Arctostaphylos manzanita*).

**32.060.00 Coyote Brush Scrub.** Coyote brush is dominant or co-dominant in the shrub canopy with bush monkeyflower (*Diplacus aurantiacus*), Himalayan blackberry, poison oak (*Toxicodendron diversilobum*) (CDFW 2021). Emergent California live oak saplings are present at low cover. The membership rule for this alliance is as follows: coyote brush > 50% absolute cover in the shrub layer (CNPS 2021). Shrub canopy is less than 3 meters in height and variable. Herbaceous layer is also variable.

Within the study area, this community comprises 0.11-acre within Intermittent Drainage-02.

#### 5.1.4.2 Land Cover Types

**Disturbed/Developed.** This land cover type includes areas that have been completely altered by human activities and contain little to no native vegetation. Within the study area, this included a 0.16-acre gravel laydown area of an industrial yard within the southeast corner.

## 5.2 Aquatic Resources

Three types of aquatic resources were documented in the study area and are described in further detail below: ephemeral drainage, intermittent drainage, and seasonal wetland swale. Figure 4, Aquatic Resources Delineation, visually depicts aquatic resources mapped in the study area. The acreages of these wetland features are included in the vegetation communities described in Section 5.1.4.



## 5.2.1 Non-Wetland Waters

### 5.2.1.1 Ephemeral Drainage

There are two ephemeral drainages comprising approximately 405 linear feet (0.05-acre) within the study area (see Attachment A, Photo 4). Ephemeral drainages are stream channels that are naturally occurring rather than anthropogenically created, and contain flowing water during, and for a short duration after, precipitation events. Hydrology of the ephemeral drainages is dependent on inputs during rain events and run-off from the surrounding uplands. Evidence of OHWM within the drainages included presence of a bed and bank, shelving, and a change in vegetation to seaside barley (*Hordeum marinum*) and fiddle dock (*Rumex pulcher*), both facultative species (USACE 2018). Upland species common in the grazed pasture were also abundant in the drainages. The drainages flow from west to east within the study area along topographic contours and contribute flows either directly or indirectly into Intermittent Drainage-01. The drainages were dry at the time of the November 2020 and May 2021 fieldwork.

### 5.2.1.2 Intermittent Drainage

There are two unnamed intermittent drainages comprising approximately 2,421 linear feet (0.96-acre) within the study area (see Attachment A, Photos 3, 6, and 7). Intermittent drainages generally have flowing water during certain times of the year, when groundwater provides water for stream flow, and receive supplemental water from rainfall runoff. Both drainages contained standing water in places at the time of the November 2020 and May 2021 fieldwork, and evidence of OHWM included bed and bank, shelving, sediment sorting, water staining, and a change in plant community and cover. Vegetation along these drainages consisted of mixed oak woodland and forest, coyote brush scrub, and non-native grassland (see Section 5.1.4.1). Herbaceous vegetation was heavily disturbed by horse grazing. The intermittent drainages flow in a southeasterly direction through the study area, with Intermittent Drainage-01 receiving flows indirectly or directly from the other drainages on-site. Intermittent Drainage-01 outlets off-site into a ditch along the eastern margin of the property which connects downstream to Icaria Creek, a tributary to the Russian River.

### 5.2.1.3 Seasonal Wetland Swale

There are two seasonal wetland swales comprising approximately 265 linear feet (0.03-acre) within the study area (see Attachment A, Photo 5). Similar to the ephemeral drainages, seasonal wetland swales are naturally occurring drainages that contain flowing water during, and for a short duration after, precipitation events. Evidence of an OHWM included a break in slope and change in vegetation. The swales contained the same mix of facultative and upland herbaceous species as the ephemeral drainages. The seasonal wetland swales flow from east to west within the study area along topographic contours and contribute flows to Intermittent Drainage-01. Seasonal Wetland Swale-01 receives water from Ephemeral Drainage-01.

## 5.3 Aquatic Resources Data Summary

Results from observable field indicators at six stream transects indicate that approximately 2.06-acre (3,091 LF) of aquatic resources occur in the study area (Figure 5, Aquatic Resources). The data collected at each transect are included in Attachment C and summarized in Table 3.

Table 3. OHWM Transect Data Summaries

Transect	Ordinary High Water Mark Field Indicators	Determination
1	Break in slope ( $>60^{\circ}$ ), shelving, presence of litter and debris, vegetation matted down, bent or absent, sediment sorting, scour, bed and banks, change in vegetation type and cover	Intermittent Drainage-01
2	Break in slope ( $<30^{\circ}$ ), change in vegetation type and cover	Seasonal Wetland Swale-01
3	Break in slope ( $>60^{\circ}$ ), shelving, bed and banks, change in vegetation type and cover	Ephemeral Drainage-01
4	Break in slope ( $>60^{\circ}$ ), shelving, sediment sorting, scour, bed and banks, water staining, change in vegetation type and cover	Intermittent Drainage-02
5	Break in slope ( $>60^{\circ}$ ), shelving, scour, bed and banks, change in vegetation type and cover	Ephemeral Drainage-02
6	Break in slope ( $<30^{\circ}$ ), change in vegetation type and cover	Seasonal Wetland Swale-02

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## 6 Conclusions

Based on the data collected during the field delineation, Dudek biologists determined that approximately 2.06-acre (3,091 LF) of aquatic resources occur on the study area (see Table 4). The jurisdictional determinations for aquatic resources delineated in the study area are preliminary until verified by the USACE San Francisco District.

**Table 4. Types and Locations of Aquatic Resources in the Study Area**

Feature ID <sup>1</sup>	Cowardin Code <sup>2</sup>	Location (Lat, Long)	Acres	Linear Feet
<b>Non-Wetland Waters</b>				
ED-01	R6	38.777732, -123.00944	0.02	202
ED-02	R6	38.778535, -123.010425	0.03	203
ID-01 (below TOB or edge of riparian, whichever is greater)	R4	38.778429, -123.009375	0.69	904
ID-01 (below OHWM)	R4	38.778429, -123.009375	0.06 <sup>3</sup>	—
ID-02 (below TOB or edge of riparian, whichever is greater)	R4	38.777776, -123.01106	1.29	1,517
ID-02 (below OHWM)	R4	38.777776, -123.01106	0.08 <sup>3</sup>	—
SWS-01	R6	38.77813, -123.009274	0.02	218
SWS-02	R6	38.778026, -123.009282	0.01	47
<b>Total<sup>4</sup></b>			<b>2.06</b>	<b>3,091</b>

<sup>1</sup> ED = Ephemeral Drainage; ID = Intermittent Drainage; OHWM = Ordinary High Water Mark; TOB = top of bank

<sup>2</sup> R4 = intermittent, riverine; R6 = ephemeral, riverine

<sup>3</sup> Intermittent drainage acreage below OHWM not double counted in total.

<sup>4</sup> Minor discrepancies in totals are the result of rounding differences between Excel and ArcMap.

### 6.1 Waters of the United States

Approximately 0.14-acre (2,421 LF) of aquatic resources occur in the study area that are anticipated to meet the criteria for jurisdictional waters of the United States. The study area does not support Traditionally Navigable Waters (TNWs), interstate waters, or waters that support interstate commerce; therefore, potential USACE jurisdiction was determined based on connectivity or adjacency to off-site waters of the U.S. The unnamed intermittent drainages on-site have downstream connectivity via roadside ditches to Icaria Creek, a tributary to the Russian River. The Russian River is considered a TNW, and therefore, the intermittent drainages meet the definition of tributary waters that contribute surface water flow directly or indirectly to a TNW. As such, the intermittent drainages are subject to the jurisdiction of USACE below OHWM, unless the drainages are determined to lack a significant nexus to the Russian River, which is located approximately 0.75 miles to the east of the study area. The length in river miles between Intermittent Drainage-01 and the Russian River is unknown as much of the feature outside of the study area flows through culverts below roadways and is not discernible in aerial photographs (Google Earth 2021). The ephemeral drainages and seasonal wetland swales within the study area only flow in direct response to precipitation and are therefore not considered waters of the United States.

## 6.2 Waters of the State

Approximately 1.04 acres (3,091 LF) of aquatic resources occur in the study area that are anticipated to meet the criteria for jurisdictional waters of the state. Contrary to the USACE, the RWQCB asserts jurisdiction over ephemeral drainages, and CDFW jurisdiction extends to the top of bank or edge of wetland or riparian vegetation rather than the OHWM of applicable aquatic resources. All aquatic resources on site are all considered waters of the state subject to RWQCB and/or CDFW jurisdiction. An additional 1.02 acres of riparian woodland outside of TOB is anticipated to fall under CDFW jurisdiction only.

# 7

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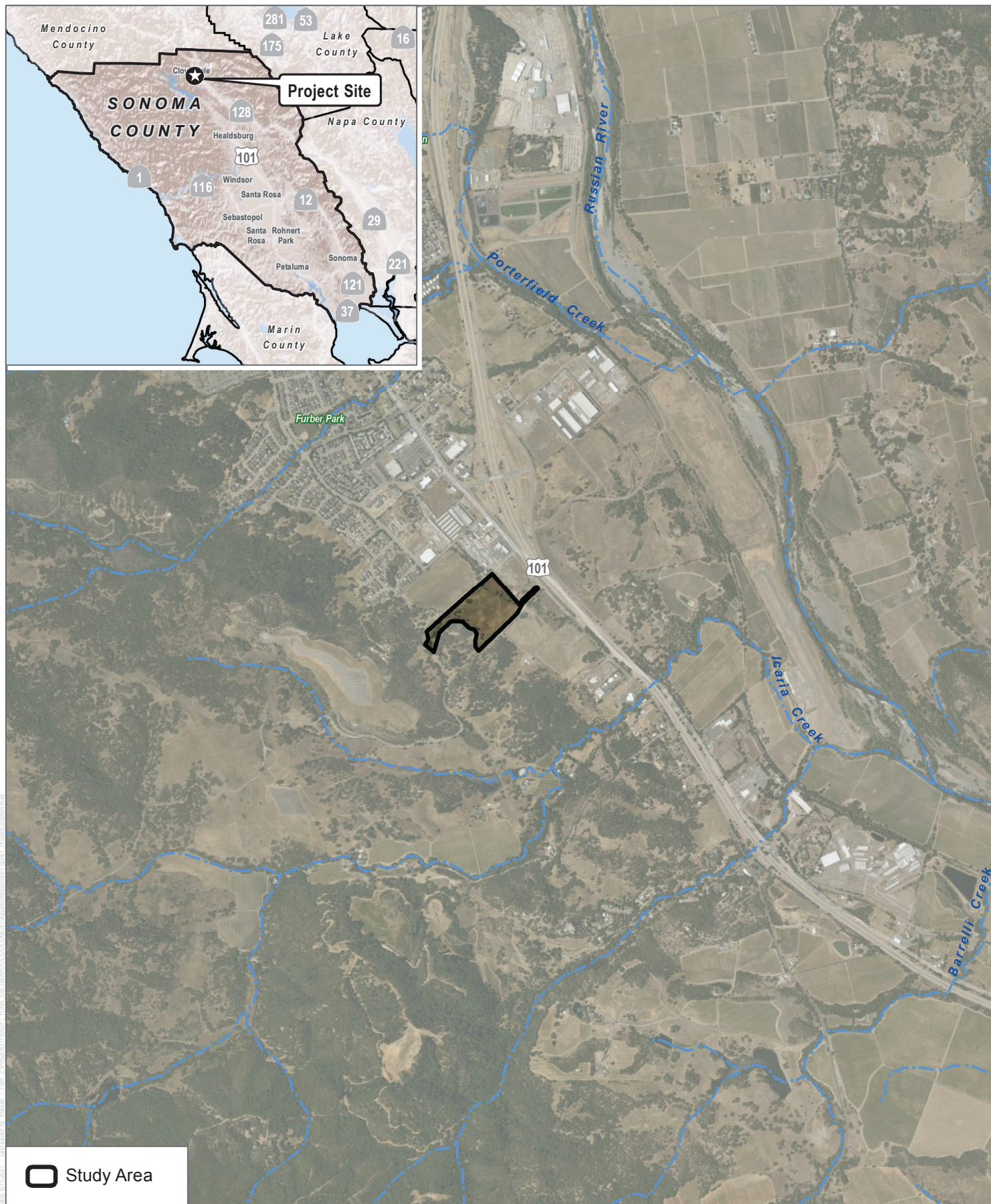
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SOURCE: Bing (Accessed 2021)

**DUDEK**



0 1,000 2,000 Feet

Aquatic Resources Delineation Report for the CUSD South Fields Project



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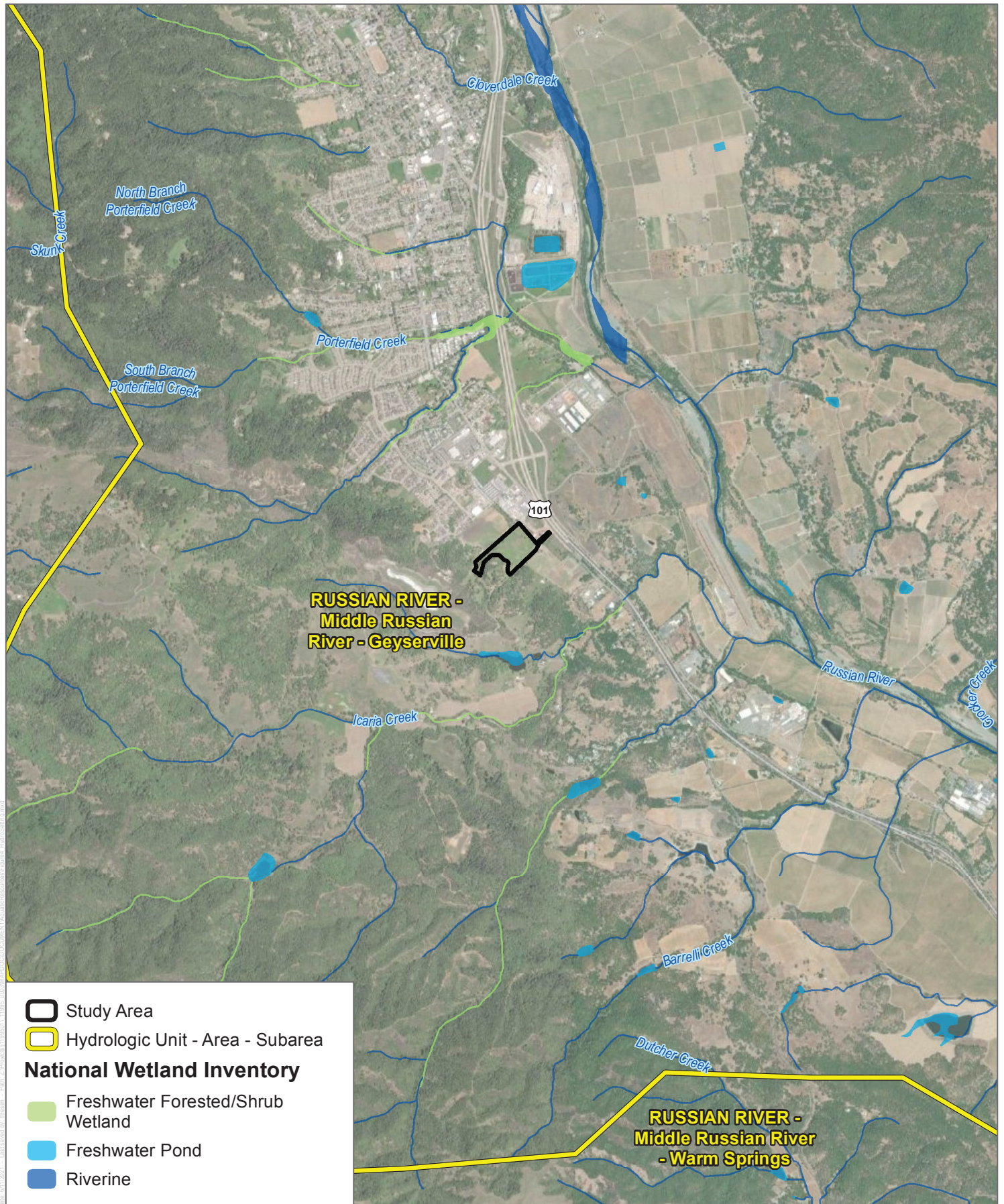


SOURCE: ESRI (Accessed 2021), USDA 2011

**FIGURE 3**  
Project Soils

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SOURCE: ESRI (Accessed 2021), USFWS 2019

**FIGURE 4**

Hydrologic Setting

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SOURCE: ESRI Basemaps (Accessed 2020)

**FIGURE 5**

## Preliminary Jurisdictional Delineation of Aquatic Resources

Aquatic Resources Delineation Report for the CUSD South Fields Project



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# Attachment A

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## Photo Log





**Photo 1.** Blue oak woodland on east-facing slopes. November 24, 2020.



**Photo 2.** Heavily grazed non-native grassland. November 24, 2020.





**Photo 3.** Mixed oak woodland within Intermittent Drainage-01.

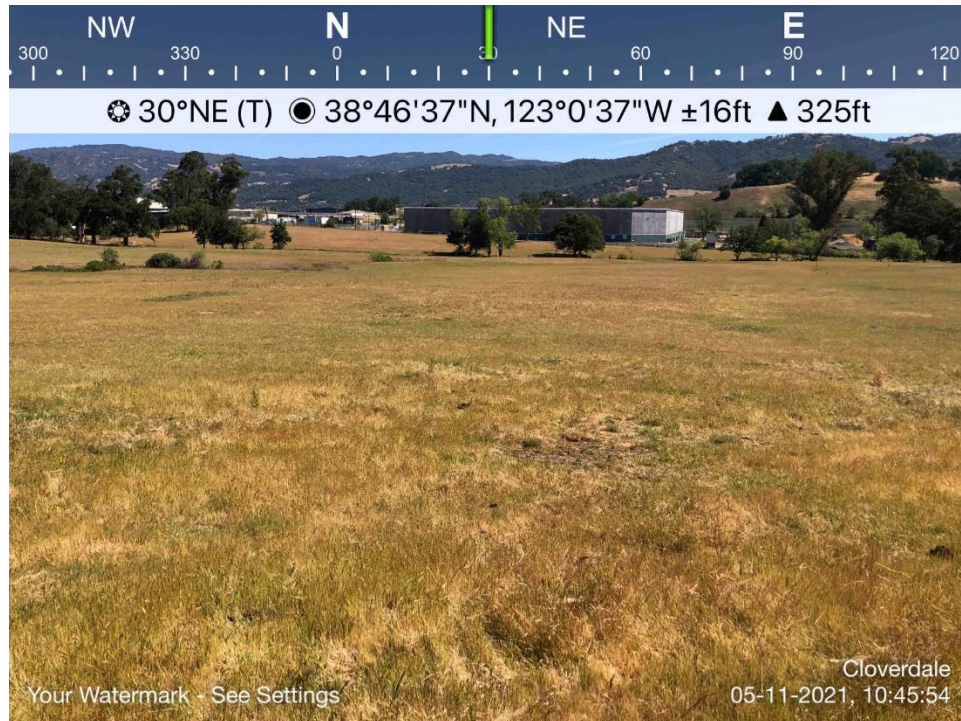


**Photo 4.** Ephemeral Drainage-01. November 24, 2020.





**Photo 5.** Seasonal Wetland Swale-01. November 24, 2020.



**Photo 3.** Non-native grassland. May 11, 2021.

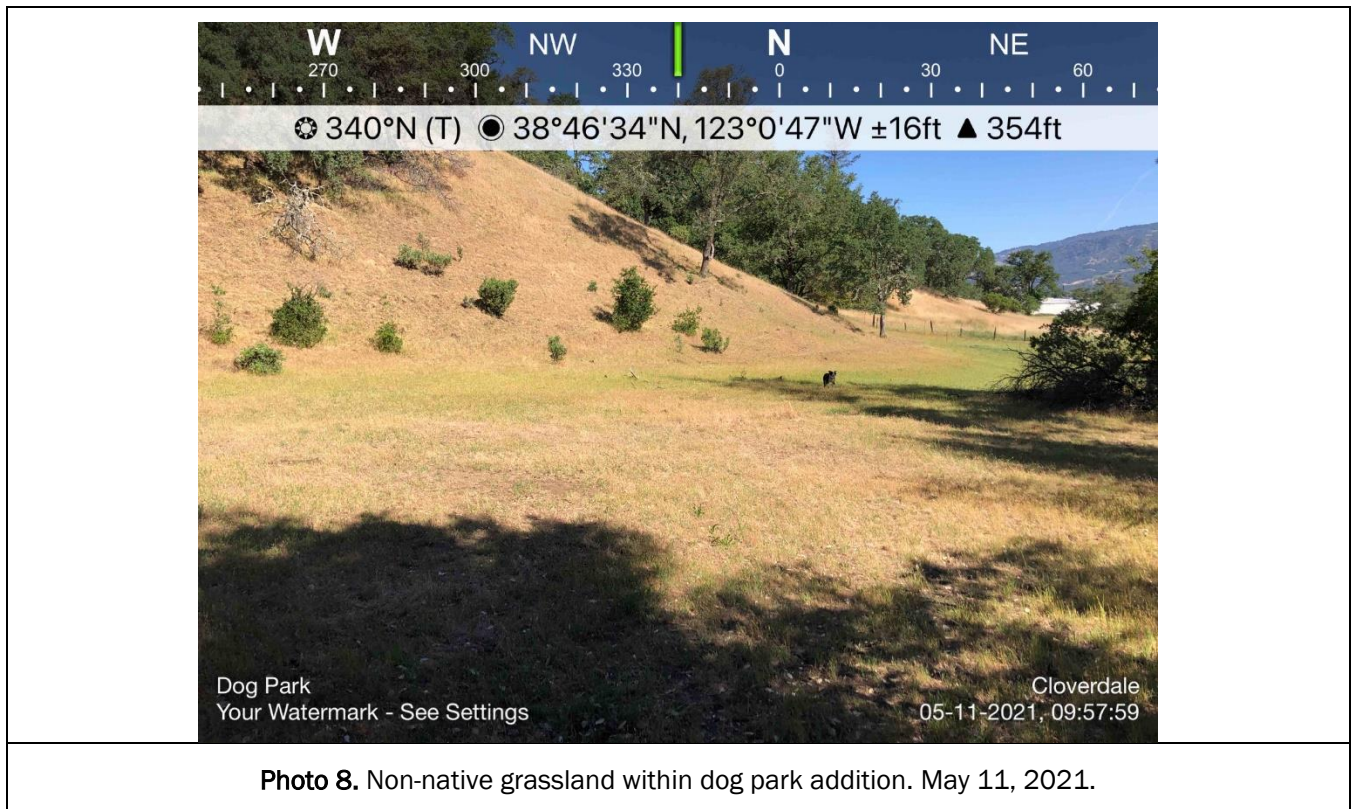




**Photo 6.** Coyote brush scrub within Intermittent Drainage-02. May 11, 2021.



**Photo 7.** Mixed oak woodland within Intermittent Drainage-02. May 11, 2021.





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# Attachment B

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## List of Plant Species Observed



## Plant Species

### *Eudicots*

### *Vascular Species*

#### **ADOXACEAE—MUSKROOT FAMILY**

*Sambucus nigra* ssp. *caerulea*—blue elderberry

#### **ANACARDIACEAE—SUMAC OR CASHEW FAMILY**

*Toxicodendron diversilobum*—poison oak

#### **ASTERACEAE—SUNFLOWER FAMILY**

*Achyrrachaena mollis*—blow wifes

*Agoseris hirsuta*—woolly goat chicory

*Baccharis pilularis*—coyote brush

\* *Carduus pycnocephalus*—Italian plumeless thistle

\* *Centaurea solstitialis*—yellow star-thistle

\* *Centromadia fitchii*—Fitch’s tarweed

*Centromadia pungens*—common tarweed

\* *Dittrichia graveolens*—stinkwort

\* *Erigeron bonariensis*—asthmaweed

*Hemizonia congesta*—hayfield tarweed

*Holocarpha heermannii*—Heermann’s tarweed

\* *Hypochaeris radicata*—hairy cat’s ear

\* *Matricaria chamomilla*—German chamomile

#### **APOCYNACEAE—DOGBANE FAMILY**

*Asclepias fascicularis*—Mexican whorled milkweed

#### **BORAGINACEAE—BORAGE FAMILY**

\* *Myosotis latifolia*—broadleaf forget-me-not

#### **BRASSICACEAE—MUSTARD FAMILY**

\* *Brassica nigra*—black mustard

\* *Raphanus sativus*—cultivated radish

#### **FAGACEAE—OAK FAMILY**

*Quercus agrifolia*—coast live oak

*Quercus douglasii*—blue oak

ATTACHMENT B  
LIST OF PLANT SPECIES OBSERVED

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*Quercus lobata*—valley oak

*Quercus wislizeni*—interior live oak

**GERANIACEAE—GERANIUM FAMILY**

- \* *Erodium botrys*—longbeak stork's bill

**LAMIACEAE—MINT FAMILY**

*Stachys albens*—whitestem hedgenettle

**LAURACEAE—LAUREL FAMILY**

*Umbellularia californica*—California bay

**LYTHRACEAE—LOOSESTRIFE FAMILY**

- \* *Lythrum hyssopifolia*—hyssop loosestrife
- \* *Punica granatum*—pomegranate

**MALVACEAE—MALLOW FAMILY**

*Sidalcea diploscypha*—fringed checkerbloom

**MYRSINACEAE—MYRSINE FAMILY**

- \* *Lysimachia arvensis*—scarlet pimpernel

**OLEACEAE—OLIVE FAMILY**

- \* *Olea europaea*—olive

**OROBANCHACEAE—BROOM-RAPE FAMILY**

- \* *Parentucellia viscosa*—yellow glandweed
- \* *Phrymaceae*—Lopseed Family
- \* *Diplacus aurantiacus*—bush monkeyflower
- \* *Erythranthe guttata*—common monkey flower

**PHRYMACEAE—LOPSEED FAMILY**

*Diplacus aurantiacus*—bush monkeyflower  
*Erythranthe guttata*—common monkey flower

**PINACEAE – PINE FAMILY**

*Pinus* spp. —ornamental pine species

**PLANTAGINACEAE—PLANTAIN FAMILY**

- Plantago erecta*—dwarf plantain
- \* *Plantago major*—common plantain

**POLEMONIACEAE—PHLOX FAMILY**

*Navarretia intertexta*—needleleaf navarretia

**POLYGONACEAE—BUCKWHEAT FAMILY**

- \* *Rumex crispus*—curly dock
- \* *Rumex pulcher*—fiddle dock

**RANUNCULACEAE—BUTTERCUP FAMILY**

*Ranunculus californicus*—California buttercup

**ROSACEAE—ROSE FAMILY**

- Heteromeles arbutifolia*—toyon
- \* *Rubus armeniacus*—Himalayan blackberry
- Prunus* spp. —various stone fruit trees

**SALICACEAE—WILLOW FAMILY**

*Populus fremontii*—Fremont cottonwood  
*Salix lasiolepis*—arroyo willow

Monocots

*Vascular Species*

**AGAVACEAE—AGAVE FAMILY**

*Chlorogalum pomeridianum*—wavyleaf soap plant

**CYPERACEAE—SEDGE FAMILY**

*Eleocharis macrostachya*—pale spike rush

**IRIDACEAE—IRIS FAMILY**

*Iris douglasiana*—Douglas iris  
*Sisyrinchium bellum*—western blue-eyed grass

**LILIACEAE—LILY FAMILY**

*Calochortus luteus*—yellow mariposa lily

**POACEAE—GRASS FAMILY**

- \* *Avena barbata*—slender oat
- \* *Briza maxima*—big quakinggrass
- \* *Briza minor*—little quakinggrass
- \* *Bromus diandrus*—ripgut brome
- \* *Bromus hordeaceus*—soft brome
- \* *Bromus rubens*—red brome
- \* *Cynodon dactylon*—Bermudagrass
- \* *Festuca perennis*—perennial rye grass
- \* *Elymus caput-medusae*—medusahead

ATTACHMENT B  
LIST OF PLANT SPECIES OBSERVED

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- \* *Hordeum marinum*—seaside barley
- \* *Hordeum murinum*—mouse barley

**THEMIDACEAE—BRODIAEA FAMILY**

*Brodiaea elegans* ssp. *elegans*—harvest brodiaea

- \* signifies introduced (non-native) species

# Attachment C

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## OHWM Datasheets







## OHWM DATA SHEET

Project: 11995

Date: 11/24/20

Transect: 01

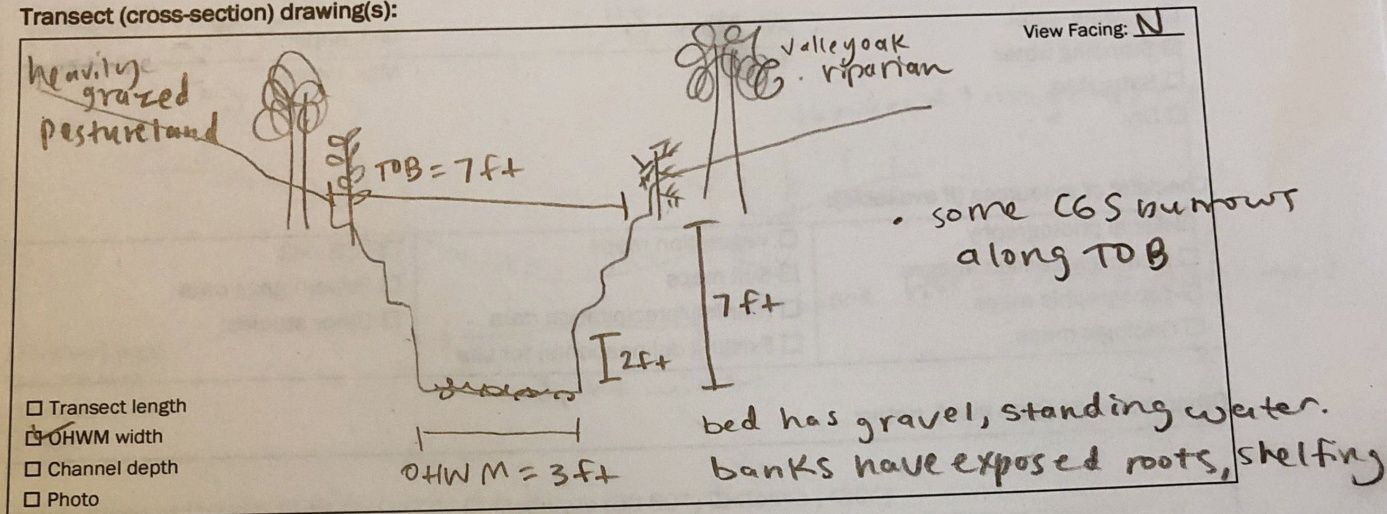
Investigator(s): AG + PK

Feature Name: 1D-01

Site Location: Cloverdale

Feature Type: ☐ Ephemeral ☒ Intermittent ☐ Perennial ☐ Other

Transect (cross-section) drawing(s):

Break in Slope at OHWM: ☒ Sharp ( $>60^\circ$ ) ☐ Moderate ( $30-60^\circ$ ) ☐ Gentle ( $<30^\circ$ )

<input type="checkbox"/> Natural line impressed on the bank <input checked="" type="checkbox"/> Shelving <input type="checkbox"/> Changes in the character of soil <input type="checkbox"/> Destruction of terrestrial vegetation <input checked="" type="checkbox"/> Presence of litter and debris <input type="checkbox"/> Wracking <input checked="" type="checkbox"/> Vegetation matted down, bent, or absent	<input checked="" type="checkbox"/> Sediment sorting <input type="checkbox"/> Leaf litter disturbed or washed away <input checked="" type="checkbox"/> Scour <input type="checkbox"/> Deposition <input checked="" type="checkbox"/> Bed and banks <input type="checkbox"/> Water staining <input type="checkbox"/> Change in plant community and/or cover
---	--

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM	100	0	0	0	0
Below OHWM	25	0	75	0	0

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	25	25	50	0
Below OHWM	0	0	50	50

Stage: ☐ Early (herbs & seedlings) ☐ Mid (herbs, shrubs, saplings) ☒ Late (herbs, shrubs, mature trees)

<b>Upland Species:</b> Arena fatua	<b>Bank Species:</b> Toyon / coffeeberry Salix spp. Quercus lobata Rubus ursinus	<b>Emergent Species:</b> Cyperus sp.
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# OHWM DATA SHEET

Condition/Disturbances (e.g., erosion, grazing, culverts, etc.):

heavy grazing

## Hydrology:

- ☐ Flowing water
- ☒ Standing water
- ☐ Saturated
- ☐ Dry

Avg. depth: 3"

Temp:

Min. depth: 0"

Max. depth: 6"

## Checklist of resources (if available):

☒ Aerial photography

☐ Remotely-sensed images

☒ Topographic maps

☐ Geologic maps

☐ Vegetation maps

☒ Soil maps

☐ Rainfall/precipitation data

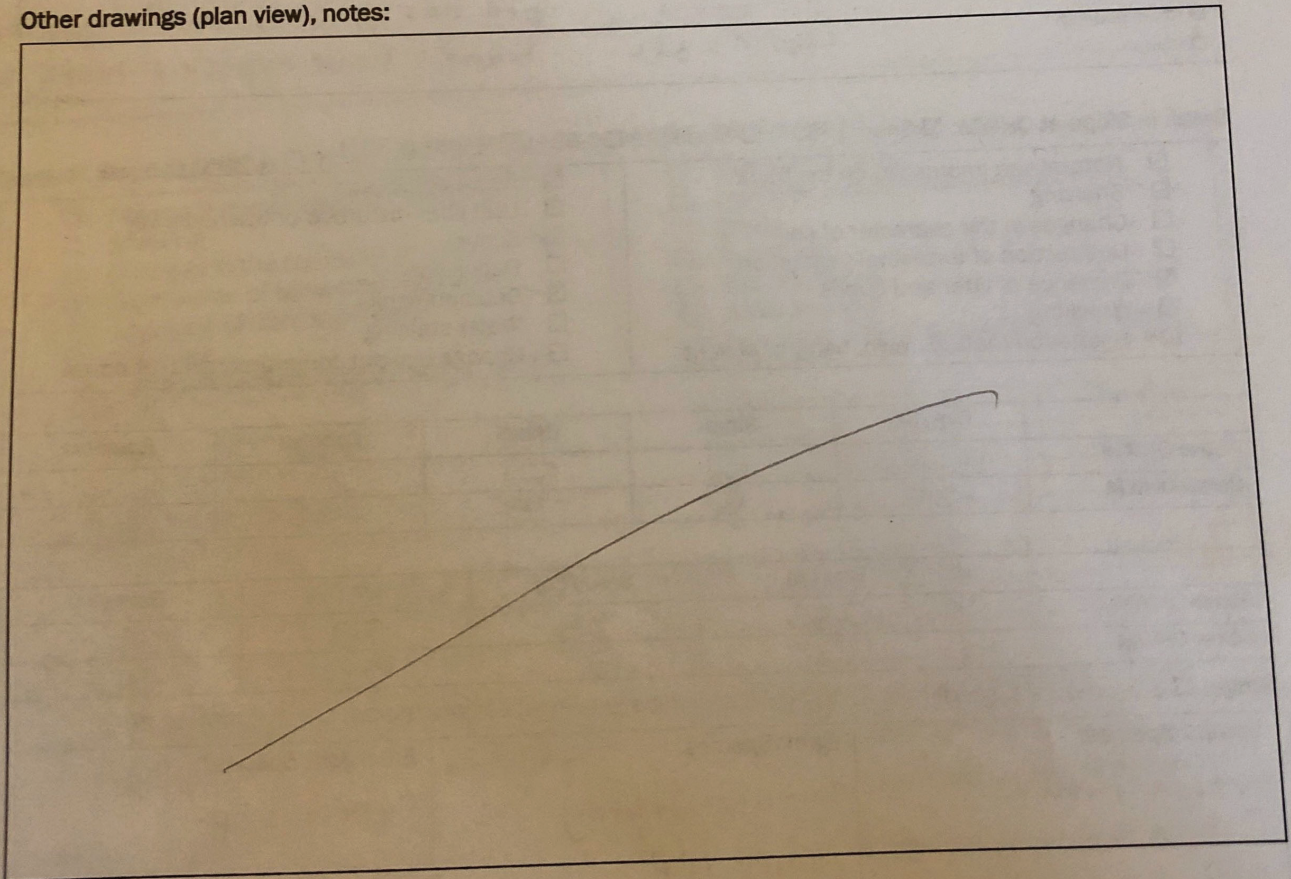
☐ Existing delineation(s) for site

☒ GPS unit

☐ Stream gage data

☐ Other studies:

## Other drawings (plan view), notes:



Other forms related to this feature: ☒ Yes ☐ No tributaries: SW S-01, ED-02, ID-0

☐ Terrace, fringe, or floodplain wetland (wetland datasheet)

☐ Low flow channel or other representative section (OHWM datasheet)



## OHWM DATA SHEET

Project: 11995

Date: 11/24/20

Transect: T-02

Investigator(s): AG+PK

Feature Name: SWS-01

Site Location:

cloverdale

Feature Type: ☒ Ephemeral ☐ Intermittent ☐ Perennial ☐ Other

Transect (cross-section) drawing(s):

View Facing: W

xheavily grazed

tarweed + n grasses

some horse hoof punches

3 ft wide

- ☐ Transect length  
☐ OHWM width  
☐ Channel depth  
☐ Photo

Break in Slope at OHWM: ☐ Sharp ( $>60^\circ$ ) ☐ Moderate ( $30-60^\circ$ ) ☒ Gentle ( $<30^\circ$ )

- ☐ Natural line impressed on the bank  
☐ Shelving  
☐ Changes in the character of soil  
☐ Destruction of terrestrial vegetation  
☐ Presence of litter and debris  
☐ Wracking  
☐ Vegetation matted down, bent, or absent

- ☐ Sediment sorting  
☐ Leaf litter disturbed or washed away  
☐ Scour  
☐ Deposition  
☐ Bed and banks  
☐ Water staining  
☒ Change in plant community and/or cover

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM	100	0	0	0	0
Below OHWM					

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	0	0	100	0
Below OHWM				

Stage: ☒ Early (herbs & seedlings) ☐ Mid (herbs, shrubs, saplings) ☐ Late (herbs, shrubs, mature trees)

Upland Species:

tarweeds  
 cynodon dactylon  
 Avena fatua

Bank Species:

Emergent Species:

Hordeum maritimum  
 Rumex pulchur



# OHWM DATA SHEET

Condition/Disturbances (e.g., erosion, grazing, culverts, etc.):

heavy grazing

## Hydrology:

- ☐ Flowing water
- ☐ Standing water
- ☐ Saturated
- ☒ Dry

Avg. depth:

Min. depth:

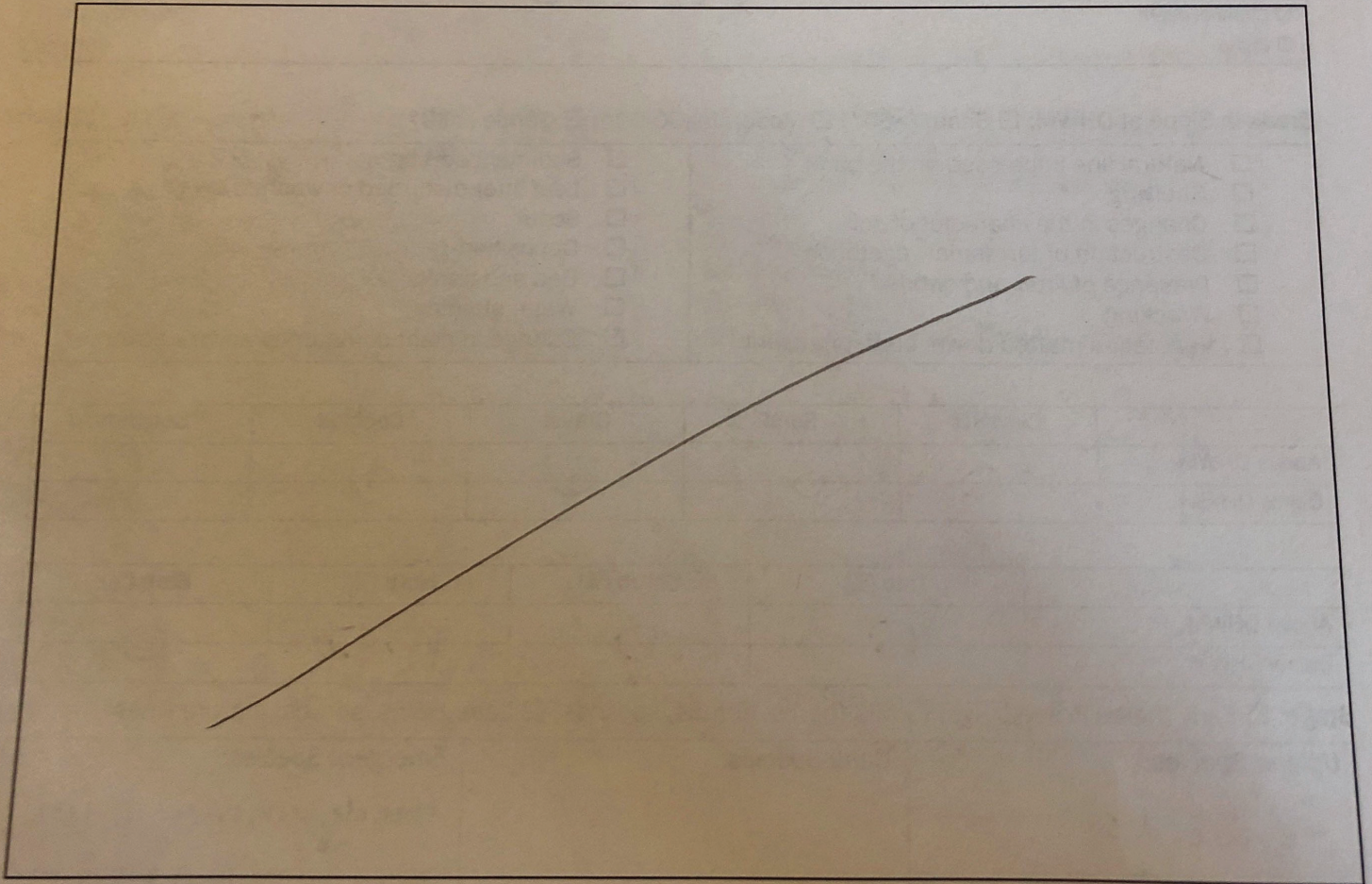
Temp:

Max. depth:

## Checklist of resources (if available):

<input checked="" type="checkbox"/> Aerial photography	<input type="checkbox"/> Vegetation maps	<input checked="" type="checkbox"/> GPS unit
<input type="checkbox"/> Remotely-sensed images	<input checked="" type="checkbox"/> Soil maps	<input type="checkbox"/> Stream gage data
<input checked="" type="checkbox"/> Topographic maps	<input type="checkbox"/> Rainfall/precipitation data	<input type="checkbox"/> Other studies:
<input type="checkbox"/> Geologic maps	<input type="checkbox"/> Existing delineation(s) for site	

## Other drawings (plan view), notes:



Other forms related to this feature: ☒ Yes ☐ No flows into 1D-01,

receives water from SW5,

☐ Terrace, fringe, or floodplain wetland (wetland datasheet)

☐ Low flow channel or other representative section (OHWM datasheet)



## OHWM DATA SHEET

Project: 11995

Date: 11/24/20

Transect: T-03

Investigator(s): AG + PK

Feature Name: ED-01

Site Location:

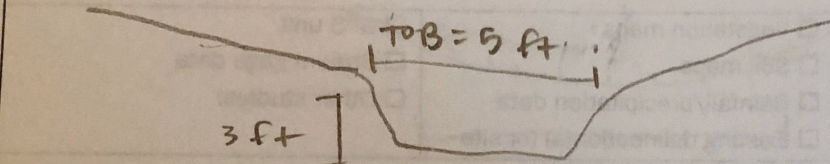
Cloverdale

Feature Type: ☒ Ephemeral ☐ Intermittent ☐ Perennial ☐ Other

Transect (cross-section) drawing(s):

View Facing: W

grazed pastureland



- ☐ Transect length  
☒ OHWM width  
☐ Channel depth  
☐ Photo

Break in Slope at OHWM: ☒ Sharp ( $>60^\circ$ ) ☐ Moderate ( $30-60^\circ$ ) ☐ Gentle ( $<30^\circ$ )

- ☐ Natural line impressed on the bank  
☒ Shelving  
☐ Changes in the character of soil  
☐ Destruction of terrestrial vegetation  
☐ Presence of litter and debris  
☐ Wracking  
☐ Vegetation matted down, bent, or absent

- ☐ Sediment sorting  
☐ Leaf litter disturbed or washed away  
☐ Scour  
☐ Deposition  
☒ Bed and banks  
☐ Water staining  
☒ Change in plant community and/or cover

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM					
Below OHWM	100	0	0	0	0

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM				
Below OHWM	0	0	100	0

Stage: ☒ Early (herbs & seedlings) ☐ Mid (herbs, shrubs, saplings) ☐ Late (herbs, shrubs, mature trees)

Upland Species:

Tan weeds  
 n-n grasses

Bank Species:

Emergent Species:

Hordeum marinum



# OHWM DATA SHEET

Condition/Disturbances (e.g., erosion, grazing, culverts, etc.):

heavy grazing

## Hydrology:

- ☐ Flowing water
- ☐ Standing water
- ☐ Saturated
- ☒ Dry

Avg. depth:

Min. depth:

Temp:

Max. depth:

## Checklist of resources (if available):

☐ Aerial photography

☐ Vegetation maps

☐ GPS unit

☐ Remotely-sensed images

☐ Soil maps

☐ Stream gage data

☐ Topographic maps

☐ Rainfall/precipitation data

☐ Other studies:

☐ Geologic maps

☐ Existing delineation(s) for site

## Other drawings (plan view), notes:

Other forms related to this feature: ☒ Yes ☐ No Turns into SWS-01

☐ Terrace, fringe, or floodplain wetland (wetland datasheet)

☐ Low flow channel or other representative section (OHWM datasheet)



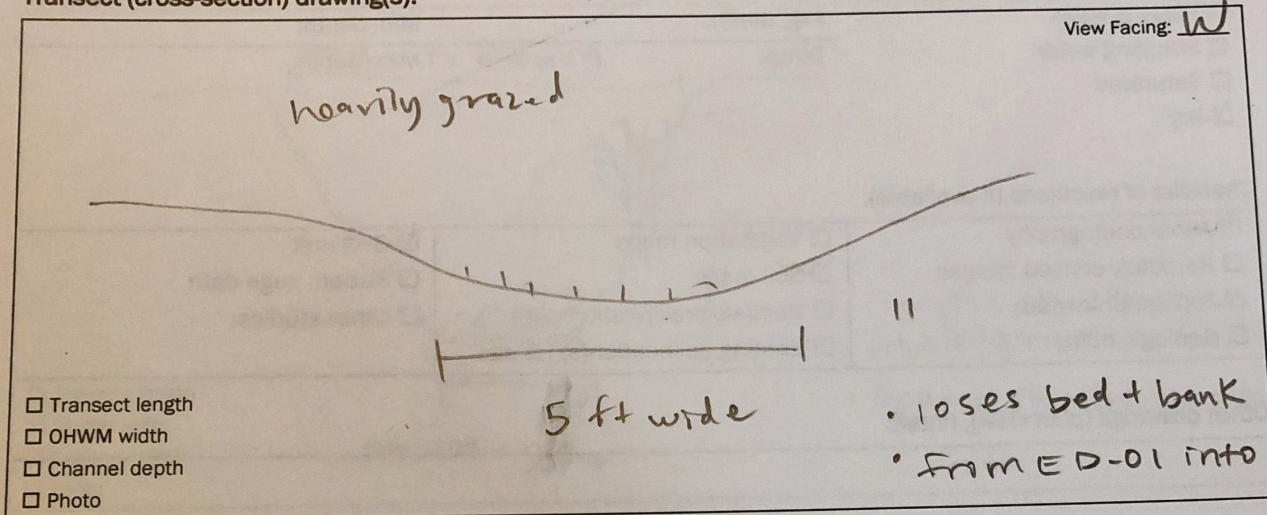
## OHWM DATA SHEET

Project: 11995 Date: 11/24/20Transect: T-06Investigator(s): AB+PKFeature Name: SWS-02

Site Location:

CloverdaleFeature Type: ☒ Ephemeral ☐ Intermittent ☐ Perennial ☐ Other

Transect (cross-section) drawing(s):

Break in Slope at OHWM: ☐ Sharp ( $>60^\circ$ ) ☐ Moderate ( $30-60^\circ$ ) ☒ Gentle ( $<30^\circ$ )

- ☐ Natural line impressed on the bank  
☐ Shelving  
☐ Changes in the character of soil  
☐ Destruction of terrestrial vegetation  
☐ Presence of litter and debris  
☐ Wracking  
☐ Vegetation matted down, bent, or absent

- ☐ Sediment sorting  
☐ Leaf litter disturbed or washed away  
☐ Scour  
☐ Deposition  
☐ Bed and banks  
☐ Water staining  
☒ Change in plant community and/or cover

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM	100	0	0	0	0
Below OHWM	0	0	0	0	0

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	0	0	100	0
Below OHWM	0	0	0	0

Stage: ☒ Early (herbs & seedlings) ☐ Mid (herbs, shrubs, saplings) ☐ Late (herbs, shrubs, mature trees)

Upland Species:

Same as  
SWS-01 +  
ED-01

Bank Species:

Emergent Species:

Hordeum marinum



# OHWM DATA SHEET

Condition/Disturbances (e.g., erosion, grazing, culverts, etc.):

heavy grazing, tire tracks

## Hydrology:

- ☐ Flowing water
- ☐ Standing water
- ☐ Saturated
- ☒ Dry

Avg. depth:

Min. depth:

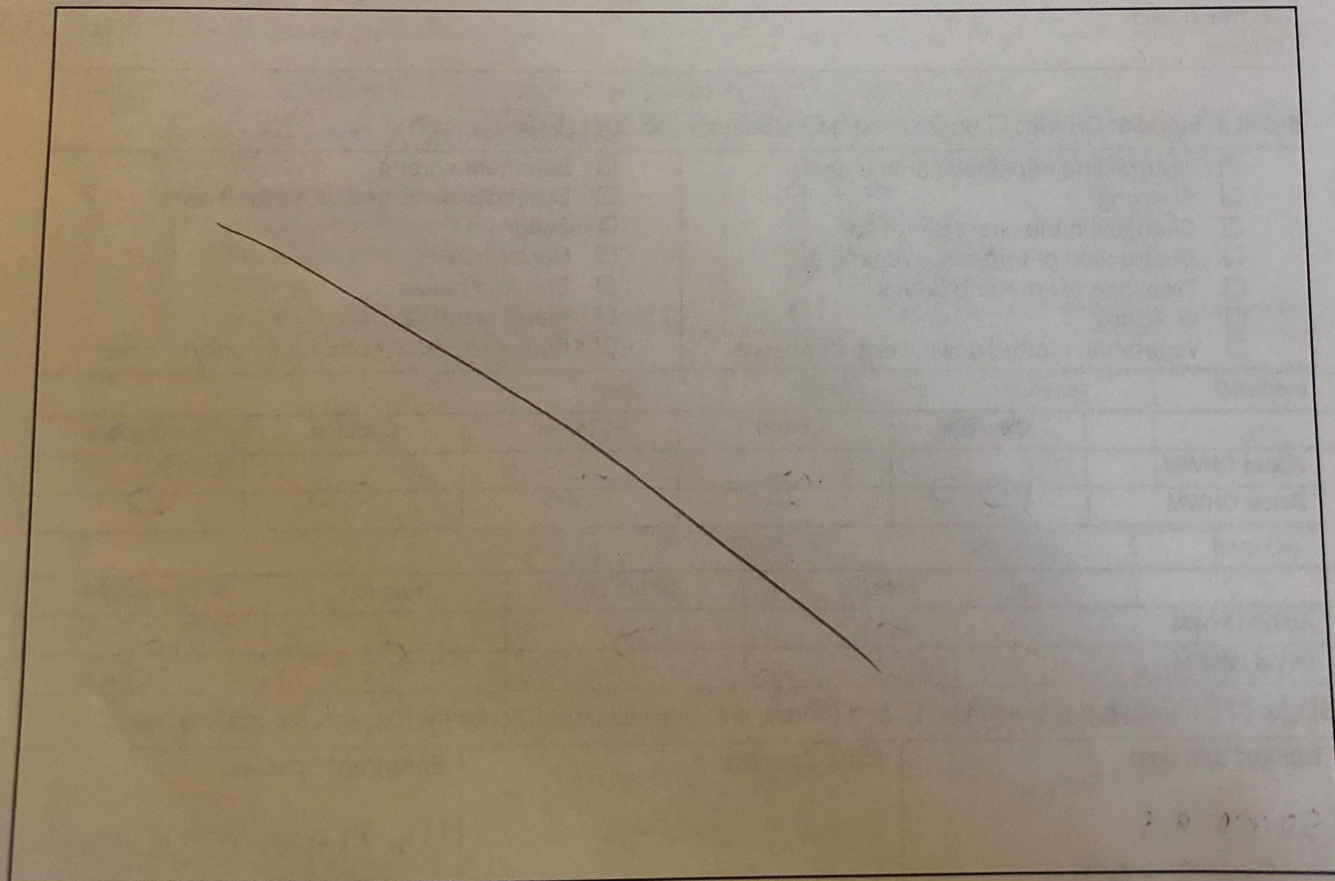
Temp:

Max. depth:

## Checklist of resources (if available):

<input checked="" type="checkbox"/> Aerial photography	<input type="checkbox"/> Vegetation maps	<input checked="" type="checkbox"/> GPS unit
<input type="checkbox"/> Remotely-sensed images	<input checked="" type="checkbox"/> Soil maps	<input type="checkbox"/> Stream gage data
<input checked="" type="checkbox"/> Topographic maps	<input type="checkbox"/> Rainfall/precipitation data	<input type="checkbox"/> Other studies:
<input type="checkbox"/> Geologic maps	<input type="checkbox"/> Existing delineation(s) for site	

## Other drawings (plan view), notes:



Other forms related to this feature: ☒ Yes ☐ No

flows into SWS-01

- ☐ Terrace, fringe, or floodplain wetland (wetland datasheet)
- ☐ Low flow channel or other representative section (OHWM datasheet)



## OHWM DATA SHEET

Project: 11995

Date: 11/24/20

Transect: T-04

Investigator(s): AG+PK

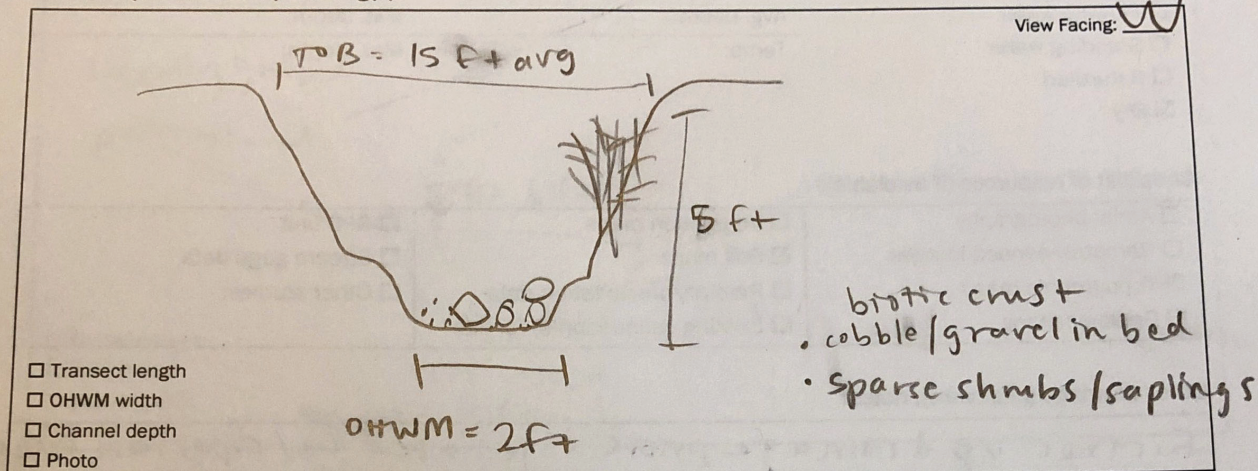
Feature Name: 1D-02

Site Location:

Cloverdale

Feature Type: ☐ Ephemeral ☒ Intermittent ☐ Perennial ☐ Other

Transect (cross-section) drawing(s):

Break in Slope at OHWM: ☒ Sharp ( $>60^\circ$ ) ☐ Moderate ( $30-60^\circ$ ) ☐ Gentle ( $<30^\circ$ )

- ☐ Natural line impressed on the bank  
☒ Shelving  
☐ Changes in the character of soil  
☐ Destruction of terrestrial vegetation  
☐ Presence of litter and debris  
☐ Wracking  
☐ Vegetation matted down, bent, or absent

- ☒ Sediment sorting  
☐ Leaf litter disturbed or washed away  
☐ Scour  
☐ Deposition  
☒ Bed and banks  
☒ Water staining  
☒ Change in plant community and/or cover

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM	100	0	0	0	0
Below OHWM	50	0	25	25	0

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	0	25	75	0
Below OHWM	0	0	0	25

Stage: ☐ Early (herbs & seedlings) ☒ Mid (herbs, shrubs, saplings) ☐ Late (herbs, shrubs, mature trees)

Upland Species:	Bank Species:	Emergent Species:
tarweeds	<i>Eriogonum fasciculatum</i>	<i>Hordeum marinum</i>
<i>Gastidium nitridum</i>	<i>Marrubium vulgare</i>	
<i>Baccharis pilularis</i>	Willow	
Bay laurel	<i>Rubus ursinus</i>	
	toyon	
	<i>Populus fremontii</i>	



# OHWM DATA SHEET

Condition/Disturbances (e.g., erosion, grazing, culverts, etc.):

grazing, stock/game trails

## Hydrology:

- ☐ Flowing water
- ☐ Standing water
- ☐ Saturated
- ☒ Dry

Avg. depth:

Temp:

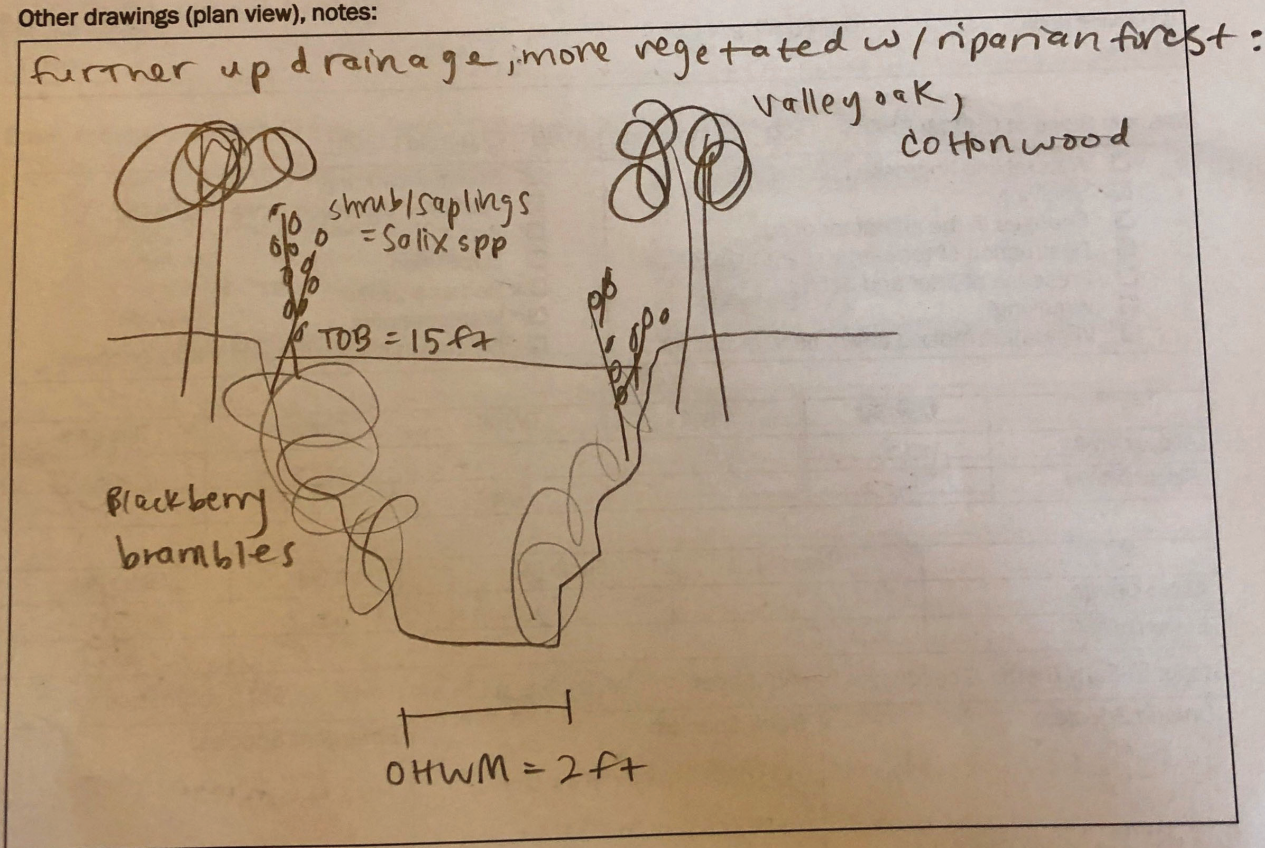
Min. depth:

Max. depth:

## Checklist of resources (if available):

- |  |   |   |
|--|---|---|
| <input checked="" type="checkbox"/> Aerial photography | <input type="checkbox"/> Vegetation maps                  | <input type="checkbox"/> GPS unit         |
| <input type="checkbox"/> Remotely-sensed images        | <input checked="" type="checkbox"/> Soil maps             | <input type="checkbox"/> Stream gage data |
| <input checked="" type="checkbox"/> Topographic maps   | <input type="checkbox"/> Rainfall/precipitation data      | <input type="checkbox"/> Other studies:   |
| <input type="checkbox"/> Geologic maps                 | <input type="checkbox"/> Existing delineation(s) for site |   |

## Other drawings (plan view), notes:



Other forms related to this feature: ☐ Yes ☐ No flows into 10-01

- ☐ Terrace, fringe, or floodplain wetland (wetland datasheet)
- ☐ Low flow channel or other representative section (OHWM datasheet)



## OHWM DATA SHEET

Project: 11995

Date: 11/24/20

Transect: I-05

Investigator(s): AG + PK

Feature Name: ED-02

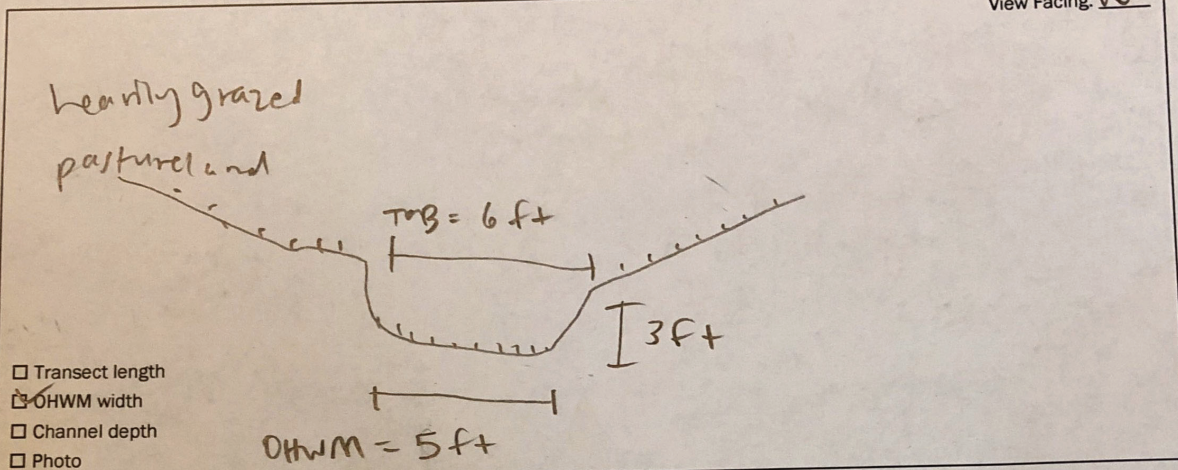
Site Location:

Cloverdale

Feature Type: ☒ Ephemeral ☐ Intermittent ☐ Perennial ☐ Other

Transect (cross-section) drawing(s):

View Facing: W

Break in Slope at OHWM: ☐ Sharp ( $>60^\circ$ ) ☐ Moderate ( $30-60^\circ$ ) ☐ Gentle ( $<30^\circ$ )

<input type="checkbox"/> Natural line impressed on the bank	<input type="checkbox"/> Sediment sorting
<input checked="" type="checkbox"/> Shelving	<input type="checkbox"/> Leaf litter disturbed or washed away
<input type="checkbox"/> Changes in the character of soil	<input checked="" type="checkbox"/> Scour
<input type="checkbox"/> Destruction of terrestrial vegetation	<input type="checkbox"/> Deposition
<input type="checkbox"/> Presence of litter and debris	<input checked="" type="checkbox"/> Bed and banks
<input type="checkbox"/> Wracking	<input type="checkbox"/> Water staining
<input type="checkbox"/> Vegetation matted down, bent, or absent	<input checked="" type="checkbox"/> Change in plant community and/or cover

	Clay/Silt	Sand	Gravel	Cobbles	Boulders
Above OHWM					
Below OHWM	100	0	0	0	0

	Tree (%)	Shrub (%)	Herb (%)	Bare (%)
Above OHWM	0	0	100	0
Below OHWM	0	0	50	50

Stage: ☒ Early (herbs & seedlings) ☐ Mid (herbs, shrubs, saplings) ☐ Late (herbs, shrubs, mature trees)

Upland Species:	Bank Species:	Emergent Species:
tarweeds	Coryza canadensis	Hordeum marinum Rumex pulchur



# OHWM DATA SHEET

Condition/Disturbances (e.g., erosion, grazing, culverts, etc.):

heavy grazing

## Hydrology:

- ☐ Flowing water
- ☐ Standing water
- ☐ Saturated
- ☒ Dry

Avg. depth:

Min. depth:

Temp:

Max. depth:

## Checklist of resources (if available):

- ☐ Aerial photography
- ☒ Remotely-sensed images
- ☐ Topographic maps
- ☒ Geologic maps

- ☐ Vegetation maps
- ☒ Soil maps
- ☐ Rainfall/precipitation data
- ☐ Existing delineation(s) for site

- ☒ GPS unit
- ☐ Stream gage data
- ☐ Other studies:

## Other drawings (plan view), notes:

narrows at fence line, OHWM = 12 ft

Other forms related to this feature: ☒ Yes ☐ No flows into ID-01

- ☐ Terrace, fringe, or floodplain wetland (wetland datasheet)
- ☐ Low flow channel or other representative section (OHWM datasheet)

# Attachment D

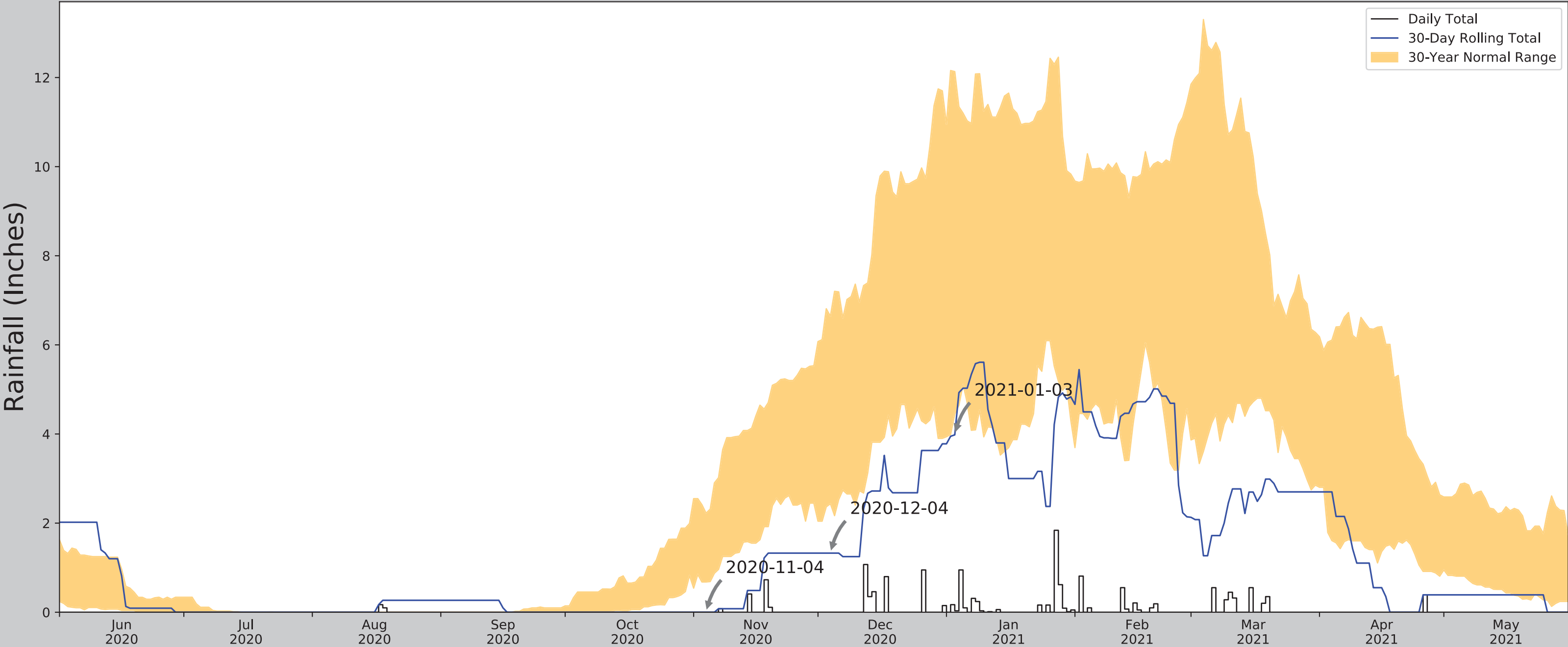
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## Antecedent Precipitation Tool Output





Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	38.777672, -123.010295
Observation Date	2021-01-03
Elevation (ft)	335.8
Drought Index (PDSI)	Moderate drought
WebWIMP H <sub>2</sub> O Balance	Wet Season

30 Days Ending	30 <sup>th</sup> %ile (in)	70 <sup>th</sup> %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2021-01-03	4.451969	12.133465	3.980315	Dry	1	3	3
2020-12-04	2.435039	6.642914	1.326772	Dry	1	2	2
2020-11-04	0.679134	2.222441	0.0	Dry	1	1	1
Result							Drier than Normal - 6

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days (Normal)	Days (Antecedent)
CLOVERDALE	38.7931, -123.0264	399.934	1.374	64.134	0.706	9823	89
CLOVERDALE 1.4 S	38.7795, -123.0145	367.126	0.259	31.326	0.125	100	1
CLOVERDALE 0.9 S	38.7861, -123.0174	347.113	0.697	11.313	0.322	175	0
CLOVERDALE 0.8 SSW	38.7893, -123.022	365.157	1.021	29.357	0.489	23	0
CLOVERDALE 0.6 W	38.799, -123.0277	381.89	1.746	46.09	0.866	49	0
CLOVERDALE 3.2 ESE	38.781, -122.963	796.916	2.558	461.116	2.331	299	0
WARM SPRINGS DAM	38.7161, -122.9975	224.081	4.31	111.719	2.421	742	0
HEALDSBURG 12.6 NNW	38.7839, -122.9628	1025.919	2.594	690.119	2.957	1	0
HEALDSBURG 4.2 NW	38.6564, -122.923	154.856	9.61	180.944	6.063	2	0
HEALDSBURG	38.6294, -122.8664	176.837	12.851	158.963	7.826	106	0
CALISTOGA	38.5961, -122.6014	399.934	25.371	64.134	13.044	33	0



Figure and tables made by the  
**Antecedent Precipitation Tool**  
Version 1.0

Written by Jason Deters  
U.S. Army Corps of Engineers



