

**Initial Study  
and Mitigated Negative Declaration  
for the  
Parrott Phelan Restoration and Maintenance Project  
December 2020**



**Lead Agency:**

Butte County Department of Development Services  
7 County Center Drive, Oroville, CA 95965

**Prepared By:**



111 Mission Ranch Blvd., Suite 100, Chico, CA 95926, Phone: 530.893.1600, Fax: 530.893.2113  
info@NorthStarEng.com | www.NorthStarEng.com

Page Intentionally Left Blank.

## Table of Contents

<b>1</b>	<b>Project Contacts and Information.....</b>	<b>1</b>
<b>2</b>	<b>Project Description .....</b>	<b>2</b>
2.1	Project Location.....	2
2.2	Project Background .....	2
2.3	Purpose and Need.....	3
2.4	Proposed Project.....	3
2.5	Environmental Setting.....	5
2.6	Other Public Agencies Whose Approval is Required/Obtained .....	6
2.7	Regulatory Guidance .....	6
<b>3</b>	<b>Determination .....</b>	<b>8</b>
3.1	Environmental Factors Potentially Affected .....	8
3.2	Determination:.....	8
<b>4</b>	<b>Environmental Checklist.....</b>	<b>9</b>
4.1	Aesthetics.....	9
4.2	Agricultural and Forestry Resources.....	11
4.3	Air Quality.....	13
4.4	Biological Resources.....	18
4.5	Cultural Resources and Tribal Cultural Resources.....	30
4.6	Energy.....	34
4.7	Geology and Soils.....	35
4.8	Greenhouse Gas Emissions.....	38
4.9	Hazards and Hazardous Materials.....	39
4.10	Hydrology and Water Quality.....	41
4.11	Land Use and Planning .....	43
4.12	Mineral Resources.....	44
4.13	Noise.....	44
4.14	Population and Housing.....	46
4.15	Public Services .....	46
4.16	Recreation.....	47
4.17	Traffic and Transportation .....	47
4.18	Utilities and Service Systems .....	49
4.19	Wildfire .....	50
<b>5</b>	<b>Mandatory Findings of Significance .....</b>	<b>52</b>
<b>6</b>	<b>Preparers and References .....</b>	<b>53</b>
<b>7</b>	<b>Acronyms and Abbreviations .....</b>	<b>55</b>

## List of Tables

Table 4.3.1: Butte County Ambient Air Quality Attainment Status (BCAQMD, 2018).....	14
Table 4.3.2: Butte County Air Quality Management District Criteria Pollutant Emissions Thresholds ....	15
Table 4.4.1: Federally listed Species with Potential to Occur in the Action Area and Effect Determinations.....	20
Table 4.4.2: State listed Species with Potential to Occur in the Action Area and Associated Status.....	20

## List of Figures

Figure 1: Location Map .....	7
------------------------------	---

## Appendices

- Appendix A: Representative Site Photos
- Appendix B: CalEEMod Outputs
- Appendix C: Biological Resources Assessment
- Appendix D: Draft Aquatic Resources Delineation



## **1 Project Contacts and Information**

---

This Project Information, Description, and Environmental Checklist contained herein constitute the contents of an Initial Study in accordance with Section 15063 of the California Environmental Quality Act (CEQA) Guidelines:

<b>Project Title</b>	Parrott Phelan Restoration and Maintenance Project
<b>Lead Agency Contact and Address</b>	Butte County Department of Development Services 7 County Center Drive Oroville, CA 95965
<b>Project Sponsor's Name and Address</b>	M&T Ranch Les Herringer, General Manager (530) 342-2954 (530) 342-4138 fax
<b>Contact Person and Phone Number</b>	Tristan Weems, Associate Planner Butte County Department of Development Services 7 County Center Drive, Oroville, CA 95965 (530) 552-3685  Les Herringer, General Manager M&T Ranch (530) 342-2954 (530) 342-4138 fax
<b>Assessor's Parcel Numbers</b>	017-260-143 and 017-270-029
<b>Ownership</b>	-143 – M&T Ranch -029 – State of California
<b>Project Size</b>	+/- 4.5 acres
<b>Zoning</b>	Foothill Residential 5 Acre (FR-5) and Resource Conservation (RC)
<b>General Plan Designation</b>	Foothill Residential (FR) and Resource Conservation (RC)

## 2 Project Description

---

### 2.1 Project Location

The proposed project is located in Township 21N, Section 27, Range 05W of the Chico and Hamlin Canyon United States Geological Survey (USGS) 7.5-minute quadrangle. The proposed project is located approximately 1.4 miles east of the City of Chico along Honey Run Road approximately 1.3 miles from its intersection with Skyway in Butte County, California. (**Figure 1-Location Map**). The proposed project occurs within Butte Creek Canyon adjacent to Butte Creek within Assessor's Parcel Numbers 017-260-143 and 017-270-029.

### 2.2 Project Background

#### *Flood Damage*

In late 1996 and early 1997 extreme precipitation events led to extensive flooding in Butte Creek Canyon. Unprecedented flows of over 35,000 cubic feet per second caused substantial property damage within the canyon. Due to the severity and scale of the flood flows, Butte Creek experienced dramatic changes in its bed morphology and course, especially in the area within and surrounding the proposed project area. During the flood events, Butte Creek shifted alignment at the Parrott-Phelan Diversion completely dewatering the diversion and the surrounding area. The diversion and fish screening project that had been completed in 1995 were in jeopardy. A cooperative project between a variety of agencies resulted in the reestablishment of the original channel and a flood bypass to handle excess flood flows to protect the diversion from channel realignment in the future. The flood bypass channel contains rock slope protection along Butte Creek just past the entrance to the overflow. Shotcrete and rock slope protection was utilized to stabilize the entrance to the overflow channel to prevent additional erosion. The overflow has a weir incorporated into it to keep flows below flood level in the main stem of Butte Creek. The project was completed in the late fall of 1997. Subsequently, a point bar established on the inside of the sharp bend where the realignment of the creek occurred where gravel is deposited during high flow events. The gravel has been removed and relocated for a number of years to prevent the continued deposition that could ultimately scour the opposing bank or divert the main course of Butte Creek into the overflow channel rendering the diversion, fish screens, fish ladder, and the CDFW fish monitoring operation obsolete.

In the winter of 2016/2017, there were extreme storm events that cause abnormally very large flow spikes and sustained high flows. According to flow gauge data from Butte Creek, which was collected by the California Department of Water Resources, flows for the 2016/2017 winter peaked at 17,700 cubic feet per second (cfs) and other peak flows topping 15,000 cfs and 11,500 cfs within a two-and-a-half-month period. These high peak flows coupled with the above average sustained flows caused increased erosion along the banks of Butte Creek. Several feet of bank was lost to undercut erosion on the southern bank immediately downstream of the weir, as well as the southern bank being eroded along the southern side of the weir itself. This erosion was precipitated by accumulated gravel downstream of the existing weir. This gravel threatened to cut off access to the existing fish ladder and diminished attractant flows from the fish ladder. Additionally, this accumulated gravel downstream of the weir has caused problems with an outfall pipe to the existing diversion that carries fish unharmed back to Butte Creek.

#### *Parrott-Phelan Diversion*

The Parrott-Phelan Diversion originates at Butte Creek just upstream of the weir structure. Water flows through three radial gates and enters the diversion where it passes through fish screens and on towards end point users to the southwest of the City of Chico. The amount of water entering the diversion is

controlled by the gates and during times of extremely high flow the gates are shut or nearly so to prevent flooding with the City of Chico, especially in the neighborhood along Paseo Companeros Street where houses abut the creek. As part of an agreement established in 1996, the diversion must keep a minimum flow within Butte Creek from October through June, 40 cfs must remain in the creek for the fish. Within the City limits, the diversion becomes Commanche Creek as it flows west through the southern portion of the city. Commanche Creek is approximately 20 feet wide for most of its length through Chico and varies in incision from shallowly incised to deeply incised as it reaches Dayton Road. Water is present within Commanche Creek for the entirety of the year and as such the creek has a narrow but establish riparian corridor along its length which may support listed species including valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*).

### *Beneficial Uses of the Diversion*

Several areas along Commanche Creek are utilized by the public for recreational activities including the Commanche Creek Greenway and the Mendocino National Forest Genetic Resource and Conservation Center. The City of Chico owns approximately 20 acres along Commanche Creek between Midway and the Union Pacific Railroad line called the Commanche Creek Greenway. The City has improved the land with a gravel parking area, improved trails, and signage. The Mendocino Genetic Resource and Conservation Center is a tree farm that has walking paths that are popular with residents.

In addition to the recreational opportunities this diversion ultimately provides the residents of the area, a number of natural resource benefits are provided as well including water for riparian habitat, groundwater recharge, waterfowl and shorebird habitat. Several wildlife areas and refuges southwest of Chico utilize water from the diversion for habitat enhancement for waterfowl during the winter months for stopover habitat in the Central Valley Flyway. As previously mentioned, the banks of Commanche Creek within the City of Chico contain a narrow but well establish riparian zone for a wide variety of species. Water is present for the entirety of the year within Commanche Creek and would provide for groundwater recharge within the valley.

As previously mentioned CDFW operates a juvenile spring-run salmon monitoring project at the Parrott-Phelan Diversion. Two traps are present a fyke trap within the diversion at the fish screens and a rotary screw trap present at the bottom end of the fish ladder, these traps are operational from approximately October through June when juvenile spring-run Chinook salmon are present in Butte Creek. This is a long-term study that has provided invaluable information to a variety of wildlife agencies regarding life history characteristics, trapping efficiencies, escapement totals, etc. This study and the adult escapement survey that is conducted during the summer months on the upper portions of Butte Creek are the longest continually running studies on a native run of spring-run Chinook salmon in California.

## **2.3 Purpose and Need**

The purpose of the project is to maintain the existing diversion and associated fish ladder and fish screen located within the project area. Routine gravel removal is necessary to maintain the existing course of Butte Creek towards the existing diversion. Additionally, areas of erosion at and near the weir are threatening the weir itself and portions of the existing infrastructure that is important for maintaining water diversion and fish passage.

## **2.4 Proposed Project**

The proposed project involves a variety of routine maintenance activities at or near the Parrott-Phelan Diversion including gravel removal, erosion repair along the bank, and erosion repair at the existing weir.

The gravel removal will be conducted at the extraction area located upstream of the existing water diversion. As has occurred in the past removals, an excavator would be utilized to remove the accumulated gravel and place it in dump haul trucks where it will be removed from the project site. In the past the gravel had been placed downstream of the existing weir above the ordinary high water mark to be reintroduced into the creek during high flow events. It has been proven that this was not working and the gravel would not mobilize as predicted during high flow events. As such the gravel accumulated below the weir and caused excessive erosion to the southern bank of Butte Creek during the winter of 2016/2017. The gravel will no longer be placed below the existing weir, instead it will be hauled off-site to the Knife River Construction yard located approximately 1.75 miles from the project area at 1764 Skyway Road, Chico, CA 95928. A berm will be left intact between the active channel of Butte Creek and the gravel extraction area to minimize potential siltation and turbidity. Additionally, silt fencing, straw wattle, and other siltation barriers will be utilized to minimize potential siltation from entering Butte Creek.

The amount of sediment removed will vary year to year, primarily influenced by flows during the winter months. Approximately, 1,800 cubic yards of accumulated material was removed during removal activities in 2018 but accumulation amounts can be as high as approximately 6,000 cubic yards. The anticipated depth of excavation will be approximately three to five feet depending on the year. Accumulated gravel will be removed between August 15 to September 7 in each year to coincide with the peak of low flows within Butte Creek, and when listed salmonids will not potentially occur within the project area. The excavator will not enter the flowing water of Butte Creek and all equipment will be steam cleared prior to beginning work. Equipment will be parked, fueled, and maintained outside of the stream zone and will access the site of Honey Run Road on the existing truck access road. No riparian vegetation will be removed as part of this project and temporary fencing will be utilized to delineate access and haul routes. It is anticipated gravel removal will take approximately two to three days to complete. Upon completion of the gravel removal any construction related best management practices including silt fencing would be removed from the extraction area.

Because the gravel removal is occurring on state owned land, there can be no profit generated from the removed gravel. A State Land Lease Agreement is being prepared for the project that will ensure these terms are met.

Repair of the existing erosion on the southern bank of Butte Creek would be accomplished by the placement of fill material and rock slope protection along the bank to protect against any future erosion. Backfill material would be placed and rock slope protection facing in the two to four-foot diameter would be placed upon geotextile fabric to repair the eroded areas. The rock slope protection would be keyed in properly to stabilize the eroded area. The rock slope protection utilized has been engineered to stand up to sheer stresses and water velocities encountered in this portion of the creek. It is anticipated the rock slope protection utilized will be quarter ton with an approximate diameter of 24 inches and above. The site would be accessed via Spanish Gardens Drive and a low water crossing would be utilized to cross the overflow channel that was created after the floods of late 1996/early 1997. Equipment utilized would include but not be limited to an excavator and haul trucks.

A triangular shaped hole has established immediately on the facing of the left side of the weir adjacent to the upper portions of wingwall of the fish ladder. The hole is approximately 30 feet long along the face of the weir and approximately 10 feet long along the wingwall of the fish ladder. It varies in depth from only a few inches deep to several feet deep where the weir meets the fish ladder. This hole threatening to undermine the concrete apron of the weir that could cause significant and costly damage. As part of the project, the existing hole would be filled with approximately 20 cubic yards of rock to repair the erosion that has taken place. It is anticipated the rock used to fill the hole will be between 200 pound and quarter ton which has a diameter ranging from approximately 16 inches to 24 inches. The site would be accessed

via the existing roads at the diversion. Equipment utilized would include but not be limited to an excavator and haul trucks.

## 2.5 Environmental Setting

Accessor's Parcel Number 017-260-143 contains the existing water diversion structures including the diversion with associated fish screens, the existing weir, and fish ladder. The diversion structure is located approximately 20 feet upstream of the existing weir. It is found on the east side of Butte Creek and consists of a concrete structure with three radial gates that control flow into the diversion. A large trash rack is present on the creek side of the radial gates to prevent debris from entering the diversion. The diversion contains two fish screens with automatic brushes the fish screens have a capacity of 150 cfs and meet all state and federal fish screening requirements. A fyke trap to collect any fish entering the diversion and is operated by California Department of Fish and Wildlife from approximately October to June for juvenile salmonid research. Below the fyke trap is a diversion pipe that moves water back into Butte Creek so any fish entering the diversion can be returned to Butte Creek unharmed. Water moves through the fish screen and continues through the City of Chico ultimately to the M&T Ranch, Rancho Llano Seco, and the wildlife areas and wildlife refuges west and southwest of the City of Chico including the Llano Seco Unit of the North Central Valley Wildlife Management Area. The existing weir spans across Butte Creek, it is approximately 110 feet wide and 45 feet long and made of concrete. It contains 14 board bays where metal guides can be raised and wooden boards to be placed that can back up water. A hole has formed immediately upstream of the weir on its left side immediately adjacent to the fish ladder. When the boards are in, a catwalk is placed along the top to allow for access across the weir. The existing fish ladder is present on the eastern side of the existing weir. The fish ladder is approximately 70 feet long and 20 feet wide and contains eight bays that create attractant flow at its terminus. From approximately October through May CDFW operates a radial screw trap that is utilized to capture juvenile salmon for an ongoing long-term study on Butte Creek.

The gravel extraction area is located on APN 017-270-029 approximately 775 feet upstream of the existing diversion at a hard bend in Butte Creek. The extracted gravel accumulates on the inside of the bend on the north side of the creek. The extraction area is accessed via a narrow dirt road off Honey Run Road. The upper portions of the bank consists primarily of arroyo willow (*Salix lasiolepis*), white alder (*Alnus rhombifolia*), sandbar willow (*S. exigua*), and Scotch broom (*Cytisus scoparius*) with non-native grasses as ground cover. Larger trees are present along the bank of Butte Creek adjacent to the dirt access road as it opens up to the extraction area. Tree species include Fremont cottonwood (*Populus fremontii*), valley oak (*Quercus lobata*), white alder (*Alnus rhambifolia*), and tree of heaven (*Ailanthus altissima*).

Butte Creek is present within the project area, it flows in a westly direction and contains water throughout the entire year. The creek is approximately 100 feet wide through the project area upstream of the existing weir and approximately 50 feet wide below the weir. The bed of the creek throughout the project area consists of cobble and gravel underlain with sand and fine sediments. Butte Creek experiences large fluctuations in flow especially during the winter months when flows will typically peak in the 1,000 to 3,000 cfs range with abnormally large peaks reaching ten to fifteen thousand cfs in some years. Base flow conditions in the summer are typically around 100-300 cfs from approximately June to October. Butte Creek can be extremely flashy during the winter and spring where the large spikes in flow dissipate very quickly, often within one or two days and return to a more consistent flow.

Topography at the site is gently sloping with an elevation of approximately 275 feet above mean sea level (msl) at the gravel extraction site to approximately 250 feet above msl at the bottom end of the weir. Surrounding land uses include vacant/undeveloped parcels to the north and east with single family residential uses to the south and west.

The mean annual precipitation is approximately 20 inches per year. The mean annual air temperature during the summer is approximately 77°F, and approximately 48°F during the winter months. (WRCC 2019). The site is approximately 500 feet above sea level. See **Appendix A** for representative site photos.

## **2.6 Other Public Agencies Whose Approval is Required/Obtained**

### United States Army Corps of Engineers

- Section 404 Clean Water Act (CWA), Nationwide Permit #3 Maintenance

### Regional Water Quality Control Board

- Section 401 CWA Water Quality Certification

### California Department of Fish and Wildlife-Fish and Game Code

- Section 1600 Lake and Streambed Alteration Agreement

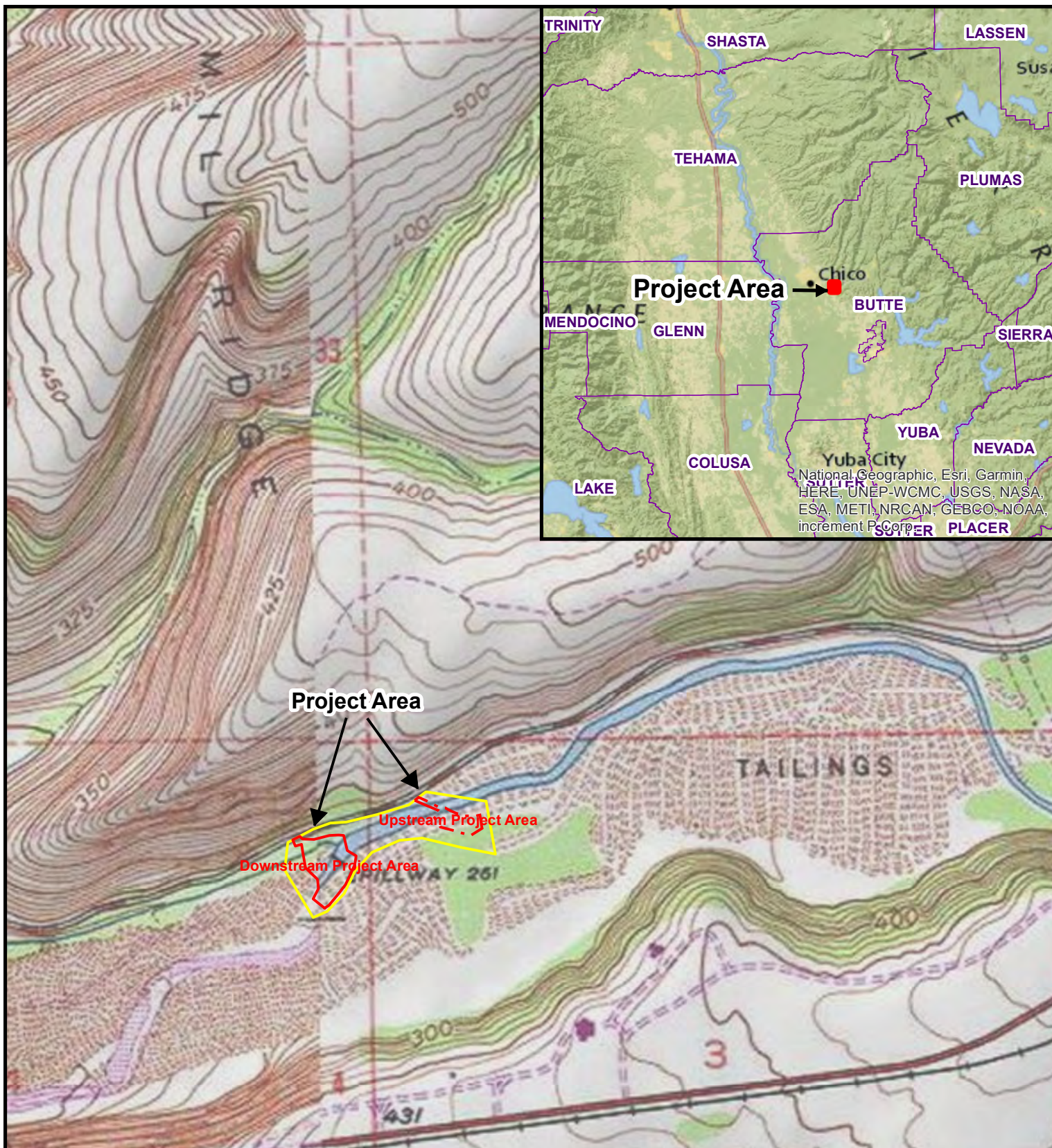
## **2.7 Regulatory Guidance**

This document is an Initial Study, prepared pursuant to the California Environmental Quality Act (CEQA), for the proposed Glenn County Road 200A Bridge Replacement project. This Initial Study has been prepared in accordance with CEQA, Public Resources Code Sections 21000 et seq. and the CEQA Guidelines found in Chapter 14 of the California Code of Regulations (CCR).

An Initial Study is conducted by a lead agency to determine if a project may have a significant effect on the environment. In accordance with CEQA Guidelines Section 15064(a)(1), an environmental impact report (EIR) must be prepared if there is substantial evidence in light of the whole record that the proposed project under review may have a significant effect on the environment. A negative declaration may be prepared if the lead agency finds that there is no substantial evidence, in light of the whole record, that the project may have a significant effect on the environment. A negative declaration is a written statement describing the reasons why a proposed project will not have a significant effect on the environment and, therefore, why the proposed project will not require the preparation of an EIR (CEQA Guidelines Section 15371). Furthermore, CEQA Section 15070 indicates that a public agency shall prepare a proposed negative declaration or mitigated negative declaration for a project subject to CEQA when the initial study has identified significant effects, but:

- (1) Revisions in the project plans or proposals in accordance with the CEQA Guidelines Section 15070(b) made by or agreed to by the applicant before the proposed mitigated negative declaration and initial study is released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur, and
- (2) There is no substantial evidence, in light of the whole record before the agency, that the proposed project as revised may have a significant effect on the environment.





## Legend

- Downstream Project Area (3.31 ac)
- Upstream Project Area (1.18 ac)
- Biological Survey Area (13.92 ac)

0 500 1,000 2,000  
Feet  
1 inch = 1,000 ft (printed at 8.5 x 11)

Imagery Source:  
USGS Topo  
Inset Imagery:  
National Geographic



Within Sections 2,3,4,  
Township 21N, Range 02E,  
Butte County, CA  
CHICO & HAMLIN CANYON  
USGS 7.5' Quad

Map Date:  
June 26, 2020

Drawn By:  
BSA

NSE Project #  
18-019

## Figure 1: Location Map

Parrott-Phelan Restoration  
- Butte County, CA -



**NORTHSTAR**  
... Designing Solutions

111 MISSION RANCH BLVD., SUITE 100 CHICO, CA 95926  
PHONE: (530) 893-1600 - [www.NorthStarEng.com](http://www.NorthStarEng.com) - © NorthStar

### 3 Determination

---

#### 3.1 Environmental Factors Potentially Affected

The environmental factors checked below could be potentially affected by this project; however, with the incorporation of mitigation measures, “potentially significant impacts are reduced to less than significant level by the project” (CEQA Guidelines Section 15382).

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Aesthetics                      | <input type="checkbox"/> Agricultural/Forestry Resources | <input checked="" type="checkbox"/> Air Quality                        |
| <input checked="" type="checkbox"/> Biological Resources | <input checked="" type="checkbox"/> Cultural Resources   | <input type="checkbox"/> Energy  |
| <input type="checkbox"/> Geology/Soils                   | <input type="checkbox"/> Greenhouse Gas Emissions        | <input type="checkbox"/> Hazards/Hazardous Materials                   |
| <input type="checkbox"/> Hydrology/Water Quality         | <input type="checkbox"/> Land Use/Planning               | <input type="checkbox"/> Mineral Resources                             |
| <input type="checkbox"/> Noise                           | <input type="checkbox"/> Population & Housing            | <input type="checkbox"/> Public Services                               |
| <input type="checkbox"/> Recreation                      | <input type="checkbox"/> Transportation                  | <input type="checkbox"/> Tribal Cultural Resources                     |
| <input type="checkbox"/> Utilities/Service Systems       | <input type="checkbox"/> Wildfire                        | <input checked="" type="checkbox"/> Mandatory Findings of Significance |

#### 3.2 Determination:

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Matt Rogers, Associate Environmental Planner  
\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature:

\_\_\_\_\_  
Butte County Water and Resource Conservation  
For



## 4 Environmental Checklist

### 4.1 Aesthetics

Would the project:	Potentially Significant	Less Than Significant with Mitigation	Less Than Significant	No Impact
a) Have a substantial adverse effect on a scenic vista?			X	
b) Substantially damage scenic resources within a state scenic highway?				X
c) Substantially degrade the existing visual character or quality of the site/surroundings?				X
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?				X

#### 4.1.1 Setting

The project area is a mix of lightly developed land (adjacent to the diversion) and undeveloped vacant land within the lower foothill region of Butte County approximately 1.4 miles east of the City of Chico city limits. Surrounding land uses include rural residential and undeveloped parcels further beyond the project area.

The topography of the site is relatively flat with an elevation of approximately 450 feet above mean sea level (msl). Prominent man-made structures on-site include the Parrott-Phelan Diversion which includes a weir structure, a fish ladder, and the diversion structure.

The Butte County General Plan Figures COS-7, COS-8, and COS-9 display identified scenic resources within Butte County. The scenic resources depicted in COS-7 include the land based scenic resources (Table Mountain, Butte Creek Canyon, Feather Falls Scenic Area, and the Sacramento River Wildlife Refuge) and water based scenic resources (Lake Oroville, Lake Wyandotte, Thermalito Afterbay, and Philbrook Reservoir).

There are no officially designated State Scenic highways within Butte County, however, State Route 70 (SR 70) north of the intersection of State Route 149 (SR 149) is considered an eligible State Scenic Highway. As seen in Figure COS-8 in the Butte County General Plan the County has designated SR 70 through the Feather River Canyon and a portion of State Route 32 (SR 32) north of Forest Ranch as County Scenic Highways.

Scenic Highway Overlay Zones are identified in Figure COS-9 of the General Plan, the zones extend 350 linear feet laterally from the centerline of each of the scenic routes identified. The Scenic Highway Overlay Zones can be found on portions of SR 32 north of Chico, the Skyway, southern portions of State Route 191 (SR 191) and Pentz Road, portions of SR 70 north of the SR 149 intersection, portions of State Route 162 (SR 162), and portions along Forbestown Road and Lumpkin Road.

The project is located within Butte Creek Canyon which is identified in the General Plan as a scenic resource within Butte County.

#### 4.1.2 Discussion

**a) Less than Significant.** The proposed project involves the routine removal of gravel to protect the existing water diversion, repairs at the existing weir, and erosion repair downstream of the weir. The

proposed project will not change regulations or policies (or their implementation) relative to aesthetic/visual resources. Project activities will not change the established visual character and planned future use of the surrounding area as similar activities already take place at the location. Gravel removal and erosional repair will not interfere with the views of scenic vistas from the adjacent residence and public right-of-way. Although the setting and unique geography of Butte County and its surrounding area have created a number of scenic vistas and corridors, the proposed project only includes annual maintenance dredging, weir repair, and erosion repair for continued diversion operation and will not have a substantial adverse effect on a scenic vista.

- b) No Impact.** There are no designated resources within a state scenic highway in the project area. Furthermore, there are no officially recognized scenic roadways in Butte County. The proposed project would not result in a significant change to the appearance of the existing roadway, nor would it eliminate access to scenic views or alter the landscapes surrounding the project site.
- c) No Impact.** The proposed project will not substantially degrade the existing visual character or quality of the site and its surroundings. The project would not create structures with a substantial vertical presence. Temporary visual impacts may occur during construction activities, when heavy equipment and construction materials will be present within the project area. Neither the function nor the general appearance of the surrounding area would be substantially modified by the proposed project.
- d) No Impact.** The improvements associated with this project do not include the installation of lighting or reflective surfaces that could contribute to substantial sources of light or glare. Additionally, construction will not occur during the evening or nighttime hours.

***Mitigation:*** *None required*

## 4.2 Agricultural and Forestry Resources

Would the project:	Potentially Significant	Less Than Significant with Mitigation	Less Than Significant	No Impact
a) Convert Farmland (Prime, Unique or of Statewide Importance) pursuant to the Farmland Mapping and Monitoring Program of the CA Resources Agency, to non-agricultural use?				X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 1220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				X
d) Result in the loss of forest land or conversion of forest land to non-forest use?				X
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?				X

### 4.2.1 Setting

The project site is found adjacent to Honey Run Road, a public road. Land uses near the project are including single-family residences at lower densities, open space, and agricultural uses.

#### Important Farmland

To characterize the environmental baseline for agricultural resources, Important Farmland Maps produced by the California Department of Conservation's Farmland Mapping and Monitoring Program (FMMP) were reviewed. Important Farmland maps show categories of Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance (if adopted by the county), Grazing Land, Urban and Built-up Land, Other Land, and Water. Prime Farmland and Farmland of Statewide Importance map categories are based on qualifying soil types, as determined by the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), as well as current land use. These map categories are defined by the Department of Conservation's FMMP as follows:

**Prime Farmland:** Land which has the best combination of physical and chemical characteristics to produce crops. It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops when treated and managed, including water management, according to current farming methods.

**Farmland of Statewide Importance:** Land that is similar to *Prime Farmland* but with minor shortcomings, such as greater slopes or less ability to hold and store moisture.

**Unique Farmland:** Land of lesser quality soils used for the production of specific high economic value crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to produce sustained high quality or high yields of a specific crop when treated and managed according to current farming methods. It is usually irrigated, but may include non-

irrigated orchards or vineyards as found in some climatic zones in California. Examples of crops include oranges, olives, avocados, rice, grapes, and cut flowers.

**Farmland of Local Importance:** Land of importance to the local agricultural economy, as determined by each county's board of supervisors and local advisory committees. Examples include dairies, dryland farming, aquaculture, and uncultivated areas with soils qualifying for *Prime Farmland* and *Farmland of Statewide Importance*.

**Grazing Land:** Land on which the existing vegetation, whether grown naturally or through management, is suitable for grazing or browsing of livestock.

**Urban and Built-up Land:** Land used for residential, industrial, commercial, construction, institutional, public administrative purpose, railroad yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment plants, water control structures, and other development purposes. Highways, railroads, and other transportation facilities are also included in this category.

**Other Land:** Land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than forty acres. Vacant and nonagricultural land surrounded by urban development and greater than 40 acres is mapped as Other Land.

**Water:** Water areas with an extent of at least 40 acres.

The project site is identified by the Department of Conservation as containing lands classified as *Other Lands*. Areas surrounding the project area include *Grazing Land* and *Urban and Built-Up Land*.

#### 4.2.2 Discussion

- a) **No Impact.** The proposed project does not occur on lands designated as Important Farmlands; the land is designated as Other Lands, the project will occur adjacent to lands designated as grazing land. Because the project occurs within lands designated as Other Lands it would not result in the conversion of Prime Farmland, Farmland of Statewide Importance, Unique Farmland or Farmland of Local Importance, as shown on the maps prepared pursuant to Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use.
- b) **No Impact.** The project will not conflict with existing zoning for agricultural use, or a Williamson Act Contract. While there are Williamson Act Contracts on lands adjacent to the project, project activities will not occur within these parcels. Therefore, relative to land use designations and Williamson Act contracts, there would be no impact.
- c) **No Impact.** The proposed project would not conflict with existing zoning for, or cause the rezoning of forestland (as defined in Public Resources Code §1220(g)), timberland (as defined in Public Resources Code §4526), or Timberland Production (as defined in Government Code §51104(g)), because the project site and the surrounding area does not contain forest land. The proposed project is located in the northern portion of California's Central Valley, a non-forested region.
- d) **No Impact.** The proposed project would not cause the rezoning or loss of forestland or timberland to non-forest use due to its location within Butte County. The project is located within the foothills of the northern portion of California's Central Valley, and, as such does not contain forest land.
- e) **No Impact.** The proposed project does not involve changes to the existing environment that could result in the conversion of Farmland to non-agricultural use as none is present within the project area.

*Mitigation: None required*

#### 4.3 Air Quality

Would the project:	Potentially Significant	Less Than Significant with Mitigation	Less Than Significant	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?			X	
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?		X		
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including emissions that exceed quantitative thresholds for ozone precursors)?			X	
d) Expose sensitive receptors to substantial pollutant concentrations?		X		
e) Create objectionable odors affecting a substantial number of people?			X	

##### 4.3.1 Setting

The proposed project is in the Northern Sacramento Valley Planning Area (NSVPA), which includes the following counties: Butte, Colusa, Glenn, Shasta, Sutter, Tehama, and Yuba. The NSVPA is bounded on the north and west by the Coastal mountain range and on the east by the southern portion of the Cascade mountain range and the northern portion of the Sierra Nevada mountains. High temperatures and low humidity, with prevailing winds from the south, characterize summer conditions. Occasional rainstorms, interspersed with stagnant and sometimes foggy weather, characterize winter conditions. Southern winds continue to predominate during the winter. Two types of inversions occur in the NSVPA: 1) during the summer, sinking air forms a lid over the region and distributes photochemical smog and 2) air cools next to the ground while air aloft remains warm causing poor dispersion of ground level pollutant emissions.

The California Air Resources Board (CARB) prepares and submits to the EPA a State Implementation Plan (SIP) explaining how the state will attain compliance with Federal clean air standards. The NSVPA is subject to federal, state, and local regulations. The NSVPA adopted an updated 2015 Triennial Air Quality Attainment Plan as its component of the SIP in compliance with the Federal and California Clean Air Acts.

The Butte County Air Quality Management District (BCAQMD) is responsible for attainment of the National and California Air Quality Standards in Butte County. The BCAQMD's primary role when reviewing projects is to evaluate their consistency with ambient air quality standards and the provisions of SIP and Attainment Plan. The following table identifies criteria pollutants and the applicable state and federal attainment status:

**Table 4.3.1: Butte County Ambient Air Quality Attainment Status (BCAQMD, 2018)**

<b>Pollutant</b>	<b>State Designation</b>	<b>Federal Designation</b>
<b>1-hour ozone</b>	Nonattainment	--
<b>8-hour ozone</b>	Nonattainment	Nonattainment
<b>Carbon monoxide</b>	Attainment	Attainment
<b>Nitrogen Dioxide</b>	Attainment	Attainment
<b>Sulfur Dioxide</b>	Attainment	Attainment
<b>24-hour PM10</b>	Nonattainment	Attainment
<b>24-hour PM2.5</b>	No Standard	Attainment
<b>Annual PM10</b>	Attainment	No Standard
<b>Annual PM2.5</b>	Nonattainment	Attainment

Sensitive receptors are frequently occupied locations where people who might be especially sensitive to air pollution are exposed to live, work, and recreate. These types of receptors include residences, schools, churches, health care facilities, daycare centers, and convalescent homes. The project site is located in a semi-rural area of Butte County, with the nearest sensitive receptors being single family residences approximately 1,000 feet from where the project would be implemented and the nearest receptors.

At the local level, responsibilities of air quality districts include overseeing stationary source emissions, approving permits, maintaining emission inventories, maintaining air quality stations, reviewing air quality sections of environmental documents, etc. The air quality districts are also responsible for establishing and enforcing local air quality rules and regulations that address requirements of federal and state air quality laws for ensuring compliance with the National Ambient Air Quality Standards and the California Standards.

The following BCAQMD rules may apply to implementation of the proposed project. This list may not be all encompassing as additional BCAQMD rules may apply. Rule 200 (Nuisance) establishes general limitations on air contaminants and Rule 205 (Fugitive Dust Emissions) limits fugitive emissions of PM10 from construction activities. The significance criteria established by BCAQMD may be relied on to make significance determinations for potential impacts on environmental resources. Analysis requirements for construction and operation-related pollutant emissions are contained BCAQMD's CEQA Air Quality Handbook: Guidelines for Assessing Air Quality and Greenhouse Gas Impacts for Projects Subject to CEQA Review (BCAQMD 2014). These thresholds are presented in Table 4.3.2. For air quality analysis purposes, the project is considered a long-term project because gravel removal will continue, only construction related thresholds were considered in this analysis.

**Table 4.3.2: Butte County Air Quality Management District Criteria Pollutant Emissions Thresholds**

Pollutant	Construction Related	Operation Related
ROG	137 pounds/day, not to exceed 4.5 tons/year	25 pounds/day
NOX	137 pounds/day, not to exceed 4.5 tons/year	25 pounds/day
PM<10 microns	80 pounds/day	80 pounds/day
Source: Butte County Air Quality Management District 2014		

#### 4.3.2 Discussion

- a) **Less Than Significant.** The proposed project is the routine removal of gravel, weir repair, and erosion repair. A project is deemed inconsistent with an air quality plan if it would result in population and employment growth that exceeds the estimates in the applicable air quality plan. Therefore, proposed projects need to be evaluated to determine whether it would generate population and employment growth and whether that growth would exceed the growth rate of the applicable plan.

The applicable air quality plan is the 2015 triennial plan, in adopting this plan, BCAQMD assumes growth within its jurisdiction will be in accordance with city and county general plans, for which air quality effects associated with build-out have been analyzed. The proposed project would result in temporary emissions of criteria air pollutants and would not result in any population or employment growth. It does not involve the construction of new expanded facilities such as housing or commercial buildings and would have no effect on growth in the County. The proposed project will be required to comply with all applicable rules, regulations, and control measures including permitting, prohibitions, and limits to emissions that work to reduce air pollution throughout California. Therefore, it will not conflict with or obstruct implementation of any air quality plans in Butte County.

- b) **Less Than Significant.** Implementation of the proposed project would result in the generation of short-term construction-related air pollutant emissions. Diesel fumes may be noticeable near the site; however, diesel fumes will be a short-term effect as gravel removal is anticipated to take two to three days, repairs at the weir will take approximately one to two days and erosional repairs downstream of the existing weir are anticipated to take 2-3 days. All equipment must comply with California emissions standards. Exhaust emissions from construction equipment would contain reactive organic gases (ROG), nitrogen oxides (NOx), carbon monoxide (CO) and particulate matter less than 10 microns in diameter (PM10). Particulate matter less than 10 microns emissions would also result from windblown dust (fugitive dust) generated during construction activities. As shown in **Table 4.3.1**, per the California Ambient Air Quality Standards (CAAQS) the project area is designated as a non-attainment area for PM10 and PM2.5.

The maximum daily emissions were modeled utilizing the most recent version of the California Emissions Estimator Model (CalEEMod) and are presented in Table 4.3.3 below and can be found in **Appendix B**.

**Table 4.3.3 Project Related Construction-Related Daily and Annual Emissions**

Category	Criteria Air Pollutants		
	ROG	NOx	PM <sub>10</sub> Total (or smaller)
<b>Threshold</b>	<b>137 lbs/day, 4.5 tons/yr</b>	<b>137 lbs/day, 4.5 tons/yr</b>	<b>80 lbs/day</b>
<b>Daily (lbs/day)</b>	1.04	12.5	1.58
<b>Annual (tons/yr)</b>	3.1 e003	0.04	4.7 e 003

As seen in the above table the project related daily and annual emissions are well below the thresholds established by BCAQMD. The project would not result in construction related emissions exceeding BCAQMD emission thresholds, having a less than significant impact to regional air quality.

- c) **Less Than Significant.** The project involves routine removal of gravel, weir repairs, and erosion repair, and does not generate new traffic, thereby generating more emissions, as would new development (i.e., residential or commercial land uses).

The project will generate short-term construction related emissions associated with equipment used for construction activities. These emissions would contain ozone precursors, PM<sub>10</sub> and PM<sub>2.5</sub>. Additional particulate matter emissions in the form of fugitive dust could be generated during ground disturbing activities for vegetation removal and placement of abutments and rock slope protection.

The proposed project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard. Each of the above impacts are temporary, local, and construction related. As discussed in the above section (b) construction emissions associated with the project would not exceed BCAQMD's quantitative thresholds. Therefore, the impact would be less than significant.

- d) **Less Than Significant With Mitigation.** The nearest residences are approximately 1,000 feet from the proposed project. Project activities consist of removal of accumulated gravel upstream of the existing diversion, repairs to the existing weir, and erosion repairs. There are no schools, hospitals, or other sensitive receptors in the area and no substantial pollutant concentrations are anticipated to occur. Temporary construction activities would result in particulate emissions in an area designated as non-attainment. However, implementation of BAMB's and the incorporation of **Air Quality MM-1** would minimize the exposure of sensitive receptors to fugitive dust to the maximum extent possible.
- e) **Less Than Significant.** Other than construction activities (diesel odors may be noticeable near the construction site), no long-term odor producing activities (i.e. landfill, wastewater treatment facility, etc.) would result from the project. Therefore, the proposed project would not result in less than significant objectionable odor impacts.

#### 4.3.3 Mitigation:



## **Air Quality MM-1**

The following best practice measures as per BCAQMD to reduce impacts to air quality will be incorporated into the project during construction as applicable. These measures are intended to reduce criteria air pollutants that may originate from the site during the course of construction operations.

### **Diesel PM Exhaust from Construction Equipment and Commercial On-Road Vehicles Greater than 10,000 Pounds**

- All on- and off-road equipment shall not idle for more than five minutes. Signs shall be posted in the designated queuing areas and/or job sites to remind drivers and operators of the five-minute idling limit.
- Idling, staging and queuing of diesel equipment within 1,000 feet of sensitive receptors is prohibited.
- All construction equipment shall be maintained in proper tune according to the manufacturer's specifications. Equipment must be checked by a certified mechanic and determined to be running in proper condition before the start of work.
- Install diesel particulate filters or implement other CARB-verified diesel emission control strategies.
- Shall not operate a diesel-fueled auxiliary power system (APS) to power a heater, air conditioner, or any ancillary equipment on that vehicle during sleeping or resting in a sleeper berth for greater than 5 minutes at any location when within 100 feet of a restricted areas.
- To the extent feasible, truck trips shall be scheduled during non-peak hours to reduce peak hour emissions.

### **Fugitive Dust**

Construction activities can generate fugitive dust that can be a nuisance to local residents and businesses near a construction site. Dust complaints could result in a violation of the District's "Nuisance" and "Fugitive Dust" Rules 200 and 205, respectively. The following is a list of measures that may be required throughout the duration of the construction activities:

- Reduce the amount of the disturbed area where possible.
- Use of water trucks or sprinkler systems in sufficient quantities to prevent airborne dust from leaving the site. An adequate water supply source must be identified. Increased watering frequency would be required whenever wind speeds exceed 15 mph. Reclaimed (non-potable) water should be used whenever possible.
- All dirt stockpile areas should be sprayed daily as needed, covered, or a District approved alternative method will be used.
- Permanent dust control measures identified in the approved project revegetation and landscape plans should be implemented as soon as possible following completion of any soil disturbing activities.
- Exposed ground areas that will be reworked at dates greater than one month after initial grading should be sown with a fast-germinating non-invasive grass seed and watered until vegetation is established.

- All disturbed soil areas not subject to re-vegetation should be stabilized using approved chemical soil binders, jute netting, or other methods approved in advance by the Butte County Air Quality Management District.
- Vehicle speed for all construction vehicles shall not exceed 15 mph on any unpaved surface at the construction site.
- All trucks hauling dirt, sand, soil, or other loose materials are to be covered or should maintain at least two feet of freeboard (minimum vertical distance between top of load and top of trailer) in accordance with local regulations.
- Install wheel washers where vehicles enter and exit unpaved roads onto streets, or wash off trucks and equipment leaving the site.
- Sweep streets at the end of each day if visible soil material is carried onto adjacent paved roads. Water sweepers with reclaimed water should be used where feasible.
- Post a sign in prominent location visible to the public with the telephone numbers of the contractor and the Butte County Air Quality Management District - (530) 332-9400 for any questions or concerns about dust from the project.”

All fugitive dust mitigation measures required should be shown on grading and building plans. In addition, the contractor or builder should designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite. Their duties shall include holidays and weekend period when work may not be in progress. The name and telephone number of such persons shall be provided to the District prior to land use clearance for map recordation and finished grading of the area.

#### 4.4 Biological Resources

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?		X		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?			X	
c) Have a substantial adverse effect on protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?			X	

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?			X	
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				X

#### 4.4.1 Setting

##### Biological Resources Assessment (BRA)

A BRA was prepared by NorthStar in December of 2019 (**Appendix C**). The BRA assessed the potential for significant impacts to special-status species. As part of the BRA, a list of special-status plant and animal species was compiled from the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation database, California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDDB), and the California Native Plant Society (CNPS) Online Inventory of Rare and Endangered Plants to determine special-status species that may potentially be affected by the proposed project. All the special-status species listed by the USFWS, CDFW, and CNPS occurring within the Chico, Hamlin Canyon, Ord Ferry, Nord, Richardson Springs, Paradise West, Llano Seco, Nelson and Shippee USGS quadrangles are included in the BRA, in Table 1. No special-status plant species were encountered during biological surveys of the project area.

Special-status wildlife species with at least moderate potential to occur within the project area include, valley elderberry longhorn beetle (*Desmicerus californicus dimorphus*), Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*), Central Valley steelhead (*Oncorhynchus mykiss*), fall-run Chinook salmon, foothill yellow-legged frog (*Rana boylei*), northwestern pond turtle (*Emys marmorata*), bald eagle (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), yellow warbler (*Setophaga petechia*), hoary bat (*Lasiurus cinereus*), North American porcupine (*Erethizon dorsatum*) silver-haired bat (*Lasionycteris noctivagans*) and western red bat (*Lasiurus blossevillii*), and birds protected by the Migratory Bird Treaty Act (MBTA).

In addition, avoidance and minimization measures would ensure impacts to aquatic and upland habitat will be reduced. The project proponent will implement avoidance and minimization measures as detailed in applicable regulatory permits to avoid impacts. Measures may include but are not limited to construction within the right-of-way (ROW), staging the equipment and the excavated material in designated areas, and using erosion control methods such as silt fencing and straw wattles.

There are federally listed special-status species with at least moderate potential to occur within the project area and associated effect determination.

**Table 2** includes federally listed special-status species with at least moderate potential to occur within the project (including the potential for foraging habitat) and an associated effect determination.

**Table 4.4.1: Federally listed Species with Potential to Occur  
in the Action Area and Effect Determinations**

Species	Effect Determination
Central Valley Steelhead ( <i>Oncorhynchus mykiss</i> ) DPS	Not Likely to Adversely Affect
Spring-Run Chinook Salmon ( <i>Oncorhynchus tshawytscha</i> )	Not Likely to Adversely Affect
Fall Run Chinook Salmon ( <i>Oncorhynchus tshawytscha</i> )	Not Likely to Adversely Affect
Valley Elderberry Longhorn Beetle ( <i>Desmicerus californicus dimorphus</i> )	No effect

**Table 3** includes State listed species and CDFW Species of Special Concern with at least moderate potential to occur within the project area.

**Table 4.4.2: State listed Species with Potential to Occur  
in the Action Area and Associated Status**

Species	Status
Foothill Yellow-Legged frog ( <i>Rana boylei</i> )	Candidate Threatened
Northwestern Pond Turtle ( <i>Emys marmorata</i> )	Species of Special Concern
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	Endangered
Yellow warbler ( <i>Setophaga petechia</i> )	Species of Special Concern
Osprey ( <i>Pandion haliaetus</i> )	Watch List
Silver-haired bat ( <i>Lasiurus noctivagans</i> )	Species of Special Concern
Western red bat ( <i>Lasiurus blossevillei</i> )	Species of Special Concern
North American porcupine ( <i>Erethizon dorsatum</i> )	Species of Special Concern

#### Draft Delineation of Aquatic Resources

A Draft Delineation of Aquatic Resources (**Appendix D**) was prepared for this project by NorthStar in January 2020. Pre-jurisdictional waters of the U.S. (WOUS) were delineated within the project area entirely made up of Butte Creek. According to the Draft Delineation, the perennial stream is Butte Creek which flows year-round within the study area. Approximately 4.27 acres of jurisdictional WOUS were delineated within the U.S. Army Corps of Engineers (USACE) survey area. The determinations concerning Waters of the United States are subject to verification by the USACE.

#### Required Regulatory Permitting

The USACE and the EPA regulate the discharge of dredged or fill material into jurisdictional waters of the United States, under Section 404 of the CWA. The issuance of a Section 404 permit is contingent on a project's demonstration of adherence to the maximum extent practicable to the following principals: 1) avoidance of impacts, 2) minimization of potential impacts, and 3) compensation for any remaining unavoidable impacts. Thus, acquisition of a Section 404 permit is indicative of adherence to the USACE "no net loss" policy for area and function of Waters of the US. Furthermore, the proposed project would be required to obtain water quality certification per Section 401 of the Clean Water Act as a condition of 404 permit acquisition. The Regional Water Quality Control Board (RWQCB) issues water quality certifications within the scope of the following mandates: Section 401 of the Clean Water Act, California Porter-Cologne Water Quality Control Act, and State and Federal No Net Loss Policies. Acquisition of water quality certification is indicative of compliance with the state's water quality standards, including beneficial uses, water quality objectives, and an anti-degradation policy.

The CDFW grants approval per the Streambed Alteration Agreement Program under one of the following two scenarios, as described in Section 1602 of the Fish and Game Code:

- The activity will not substantially adversely affect an existing fish or wildlife resource, and that the entity may commence the activity without an agreement.
- The department determines that the activity may substantially adversely affect an existing fish or wildlife resource and issues a final agreement to the entity that includes reasonable measures necessary to protect the resource, and the entity conducts the activity in accordance with the agreement.

#### 4.4.2 Discussion

- a) **Less Than Significant With Mitigation.** Field surveys of the project area were conducted on March 7, 2018 by NorthStar biologists Matt Rogers and Andrew Huneycutt, March 29, 2018 by NorthStar biologists Carol Wallen and Matt Rogers, October 1, 2018 by NorthStar biologists Matt Rogers and Billy Abbott, August 12, 2019 by NorthStar biologists Matt Rogers and Aly Johnson, and September 5, 2019 by NorthStar biologist Jake Sivertson. Based on the survey results and review of existing documentation, 13 special-status species have at least moderate potential to occur within the project area, including valley elderberry longhorn beetle, central valley spring-run Chinook salmon, fall run Chinook salmon, Central Valley steelhead, foothill yellow-legged frog, northwestern pond turtle, bald eagle, yellow warbler, osprey, hoary bat, silver-haired bat, western red bat, North American porcupine, and migratory birds protected by the MBTA. Species with a low or no potential to occur within the project site are not discussed further because the potential for these species to occur is negligible (Refer to Table 1 in the BRA). The 13 special-status species with a moderate potential to occur are discussed in further detail below.

##### *Valley Elderberry Longhorn Beetle*

The valley elderberry longhorn beetle (VELB) is federally listed as threatened and critical habitat has been designated by the USFWS. The beetle is endemic to riparian systems along the margins of rivers and streams, and in adjacent grassy savannas in California's Central Valley. The VELB occurs in the Central Valley of California below 3,000 feet. It is distributed primarily within riparian habitats from Shasta County to Kern County. Valley elderberry longhorn beetles feed and reproduce exclusively on two species of elderberry, including blue elderberry (*Sambucus nigra* ssp. *caerulea*) and red elderberry (*S. racemosa*). The adult female beetles deposit eggs in the bark crevices of living plants. Larvae bore into the pith (plant tissue in the center of the stem) of larger elderberry stems upon hatching, where the majority of the animal's lifespan occurs. Following pupation in the spring, the adult beetle emerges, creating a hole in the bark of the stem or branch. Adults feed on foliage and are present from March through early June. Because the adult stage is short lived, survey techniques focus on the presence of emergence holes for evidence of VELB. Valley elderberry longhorn beetle emergence holes have been observed in shoots or branches with diameters as small as 0.5 inches (13 mm) but are more common in older, larger branches. Besides exhibiting a preference for "stressed" elderberry shrubs, VELB prefer shrubs with stems of a certain size class. Exit holes have been found more frequently in trunks or branches that are 5 to 20 cm (2-8 in) in diameter, or at least 1.0 inch or greater at ground height (USFWS 1999) and less than one meter off the ground (Collinge et al. 2001). Research also shows that exit holes more consistently occur in clusters or stands of elderberry shrubs surrounded by associate riparian vegetation, rather than in isolated shrubs (Collinge et al. 2001). Exit holes are circular to slightly oval and are usually 7-10 mm in diameter. Valley elderberry longhorn beetles are the only insect species known to inhabit live elderberry shrubs and/or make exit holes of a similar size and shape in the Central Valley (USFWS 1991).

A lone blue elderberry is present within the BSA and occurs along Honey Run Road, however it is over 100 feet from any construction activity. No VELB or evidence of their presence was detected within the project area. The implementation of **Biological Resources MM – 1** and **Biological Resources MM - 2** would ensure project related impacts to VELB would be less than significant.

#### *Central Valley Spring-Run Chinook Salmon ESU*

Spring-run Chinook salmon (*Oncorhynchus tshawytscha*) were historically the second most abundant run of Central Valley Chinook salmon (Fisher, 1994). Adults returning to spawn ascended the tributaries to the upper Sacramento River, including the Pit, McCloud, and Little Sacramento Rivers. They also occupied Cottonwood, Battle, Antelope, Mill, Deer, Stony, Big Chico, and Butte Creeks, and the Feather, Yuba, American, Mokelumne, Stanislaus, Tuolumne, Merced, San Joaquin, and Kings Rivers. Spring-run Chinook salmon, similar to steelhead, migrated into headwater streams where cool, well-oxygenated water is available year-round.

Current surveys indicate that remnant; non-sustaining spring-run Chinook salmon populations may be found in Cottonwood, Battle, Antelope, and Big Chico Creeks (California Department of Water Resources, 1977). More sizeable, consistent runs of naturally produced fish are found in Mill, Deer, and Butte Creeks. The Feather River Fish Hatchery sustains the spring-run population on the Feather River, but the genetic integrity of that run is questionable (California Department of Water Resources, 1977). Feather River water has been diverted to Butte Creek for many years. However, the degree of straying of Feather River spring-run Chinook salmon into Butte Creek is assumed to be very limited. Spring-run Chinook salmon may occur in the Yuba River; however, the size of the run and the level of possible hybridization with fall-run Chinook salmon are unknown (California Department of Fish and Game, 1998).

On March 9, 1998 (68 FR 11481), NOAA Fisheries issued a proposed rule to list spring-run Chinook salmon, and on September 16, 1999 (64 FR 50393), NOAA Fisheries listed spring-run Chinook salmon as threatened. NOAA Fisheries designated critical habitat for spring-run Chinook salmon of February 16, 2000 (65 FR 7764). On February 5, 1999, the California Fish and Game Commission listed spring-run Chinook salmon as threatened under the California ESA. Spring-run Chinook tend to spawn almost exclusively in the Low Flow Channel.

Spring-run Chinook salmon typically arrive in Butte Creek mid-February. They are transients in the BSA, passing through on their way to deeper pools, further upstream, higher in the canyon, where they hold until spawning which occurs in late September. During spawning they spread back out, downstream but are not known to spawn as far down stream as the BSA. Water temperatures within the BSA during the summer months are lethal to salmonids of all life stages and there are no deep holding pools that could support adults as they hold in the creek before spawning. Juveniles can be found within the BSA, using backwaters and heading downstream, eventually to the ocean, from October through May. A long term CDFW study, focusing on juvenile spring-run Chinook salmon trapping efforts, has been, and continues to be, conducted at the Parrot-Phelan diversion dam.

The implementation of **Biological Resources MM – 3** would ensure project related impacts to spring-run Chinook salmon would be less than significant.

#### *Central Valley Fall and Late Fall-Run Chinook Salmon*

Fall-run Chinook salmon (*Oncorhynchus tshawytscha*) were historically the most abundant run of Central Valley Chinook salmon (Fisher, 1994). They occupied the entire Sacramento and San Joaquin River drainages, but the numbers were reduced beginning in the mid 1900's as a result of commercial fishing, blockage from historical spawning and rearing habitat, water-flow fluctuations, unsuitable

water temperatures, and reduction of habitat quality. The fish currently inhabit river reaches downstream of major dams on Central Valley Rivers, including the Sacramento, Feather, Yuba, American, Mokelumne, Stanislaus, Tuolumne, and Merced, as well as smaller tributaries to the Sacramento River and the Delta.

On March 9, 1998 (63 FR 11481), NOAA Fisheries issued a proposed rule to list fall-run Chinook salmon as threatened, but on September 16, 1999 (64 FR 50393), NOAA Fisheries determined that they did not warrant being listed as threatened and downgraded them to candidate status. NOAA Fisheries indicated that the Central Valley fall-run and late fall-run Chinook salmon is a single evolutionary significant unit (ESU). They are discussed together in this section even though there are some differences in life history for the two runs. There is no state protection for fall-run Chinook salmon.

After 2 to 4 years of maturation in the ocean, adult Chinook salmon return to their natal freshwater streams to spawn. Adult fall-run Chinook salmon migrate upstream between mid-September and December, with peak migrations occurring between October and November. Newly emerged fry remain in shallow, lower velocity edge waters, particularly where debris congregates and makes the fish less visible to predators (California Department of Fish and Game, 1998).

Juvenile fall-run and late fall-run Chinook salmon rear from January to June. Occurrence of fall-run peaks between February and May. Cover, space, and food are necessary components of fall-run Chinook salmon rearing habitat. Suitable habitat includes areas with in stream and overhead cover in the form of undercut banks, downed trees, and large, overhanging tree branches. The organic materials that form fish cover also help provide sources of food, such as aquatic and terrestrial insects. Once the fry emerge from the gravel, they typically spend little time rearing in the river. The emigration period is generally December through June, with the peak sometime between January and March (DWR unpublished data). A small number of fall salmon (5,000-15,000) may continue to rear in the river throughout the summer.

Fall and late fall-run Chinook salmon typically arrive in Butte Creek in October and peak spawning occurs in October and November, but can continue into January. Juveniles emerge from the gravel beds from December to March, and although they may remain in freshwater systems for up to 7 months, they typically quickly move out of the smaller tributaries into larger river systems within a few weeks. Fall and late fall-run Chinook salmon can be found within the BSA from October until March. A long term CDFW study, including trapping efforts, has been, and continues to be, conducted at the Parrot-Phelan diversion dam.

The implementation of **Biological Resources MM – 3** would ensure project related impacts to fall and late fall-run Chinook salmon would be less than significant.

#### *Central Valley Steelhead DPS*

The Central Valley steelhead (*Oncorhynchus mykiss*) is listed as threatened (63 FR 13347, March 19, 1998), and critical habitat was designate to include rivers and streams of the Sacramento-San Joaquin River system (65 FR 7764, February 16, 2000). Within California's Central Valley, only winter steelhead are known to remain. Peak spawning of steelhead occurs from December to April in the cool, well-oxygenated streams and tributaries. In the Feather River in particular, most steelhead adults travel from the ocean to the river from September through January, where spawning takes place rather quickly. Steelhead use gravel-sized material for spawning, however, they are also known to use a mixture of sand-gravel and gravel-cobble. The gravel must be permeable to keep the eggs well oxygenated (McEwan, 2001). It is presumed that soon after spawning, those that survive the journey

return to the ocean, although some may remain as residents. Eggs typically hatch in 30 days depending on the water temperature, and fry typically emerge 4 to 6 weeks after hatching, however, gravel size, siltation, and temperature can be controlling factors. Soon after emerging from the gravel, a small percentage of the fry appears to emigrate. The remainder of the population typically remains in the river for at least six months to 1 year. Fry and juveniles tend to inhabit shallow protected areas including stream margins and in-stream areas with large woody debris and/or areas with overhead cover and low light levels.

Central Valley Steelhead begin to move into Butte Creek in early winter, usually starting after the first winter rain events. Typically, they are transients within the BSA, passing through on their way further upstream to spawning grounds, but it is conceivable that they would spawn within the BSA which would occur during the winter months.

The implementation of **Biological Resources MM – 3** would ensure project related impacts to Central Valley steelhead would be less than significant.

#### *Foothill Yellow-legged Frog*

The yellow-legged frog is a state species of concern which occurs along the Coast Range of California, to the Transverse Mountains in Los Angeles County, and throughout most of northern California west of the Cascade crest. It can be found in or near rocky streams in a variety of habitats including valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, costal scrub, mixed chaparral, and wet meadows. Adult yellow-legged frogs eat both aquatic and terrestrial invertebrates and yellow-legged frog tadpoles generally graze on algae and diatoms on rocky stream bottoms. The foothill yellow-legged frog is typically found in partly shaded, shallow streams and riffles with a rocky substrate in a variety of aquatic habitats. They generally prefer low- to moderate-gradient streams, especially for breeding and egg-laying, requiring at least some cobble-sized substrate for egg-laying, which they do following the end of spring flooding (mid-March to May). During the summer and fall, adult frogs prefer stream channels that provide exposed basking sites and cool shady areas. The tadpoles require water for at least 3 to 4 months while continuing to develop, hence the yellow-legged frog is rarely found far from permanent water sources. Garter snakes and bullfrogs have been documented as predators of the yellow-legged frog. Although suitable habitat is present within the project area, no foothill yellow-legged frogs were observed during biological surveys within the project area. Implementation of **Biological Resources MM-4** would ensure potential impacts to foothill yellow-legged frog would be less than significant.

#### *Northwestern Pond Turtle*

The northwestern pond turtle is a CDFW Species of Special Concern that occurs within a variety of habitats across the state. Northwestern pond turtles are associated with permanent or nearly permanent waters including ponds, lakes, sloughs, streams, irrigation ditches. Potentially suitable aquatic and nesting habitat occurs within the project area. Although no turtles of any species were observed during the biological survey of the project area in April 2017. Implementation of **Biological Resources MM-5** would ensure project related impacts to northwestern pond turtles would be less than significant.

#### *Bald Eagle*

The bald eagle (*Haliaeetus leucocephalus*) is known to occur from Alaska to California and in California it is a permanent resident, now restricted to breeding mostly in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity Counties. Bald eagles are also found in a few favored inland waters in Southern California. They are more common at lower elevations, and are not found



in the high Sierra Nevada. They require large bodies of water or free flowing rivers with abundant fish, and adjacent snags or other perches. Bald eagles will occasionally forage in flooded fields for displaced voles or other small mammals. They will also scavenge dead fish, water birds, and mammals, and have been known to steal from osprey. Typically, nests are within 1.6 km (1 mile) of water in large, old-growth, or dominant live trees with open branch work (less than 40% canopy). Nests are usually located 16-61 m (50-200 feet) above the ground. Breeding occurs from February to July; however, they don't begin nesting if human disturbance is evident. (USFWS 2018)

Bald eagles are well documented along Butte Creek. Although suitable foraging and nesting habitat occurs within the BSA, during biological surveys of the BSA no bald eagles, or their large, conspicuous stick nests were overserved. The implementation of **Biological Resources MM-6** will ensure potential impacts to bald eagle would be less than significant.

### *Osprey*

The osprey (*Pandion haliaetus*) is a migratory raptor species that feeds almost exclusively on live fish. Foraging in clear, open waters, ospreys dive feet first to catch their prey. This species is considered a Species of Special Concern by the CDFW, despite recent population increases following the elimination of pesticide use such as DDT, which caused population decline during the 1950s and up to 1970. Osprey populations appear to be increasing since the 1970s. Nests are constructed from sticks to form platforms on top of dead-topped trees, cliffs, man-made structures (i.e. cell phone and utility towers), and occasionally on the ground. Ospreys arrive on nesting grounds mid-March to early April and lay between 1-4 eggs. Southern migration occurs in October, with osprey flying along the coast and western slopes of Sierra Nevada in October to Central and South America (CDFG 2005).

Although the BSA offers suitable nesting and foraging habitat for osprey no osprey or their large, conspicuous stick nests were observed during biological surveys. The implementation of **Biological Resources MM – 6** would ensure project related impacts to osprey would be less than significant.

### *Yellow Warbler*

The yellow warbler (*Setophaga petechia*) is a summer resident found throughout California in riparian woodlands from coastal and desert lowlands up to 2500 meters in the Sierra Nevada Mountain Range. They can also be found in montane chaparral, open ponderosa pine forest and mixed conifer habitats with substantial amounts of brush. They mainly eat insects and spiders and typically glean and hover in the upper canopy of deciduous trees and shrubs. The yellow warbler requires riparian deciduous habitats and montane habitats with tall trees for singing and foraging and a dense understory of shrubs for nesting. They are active diurnally and migrants typically arrive in California in April and remain until October. A small number of yellow warblers are known to over-winter in Southern California lowlands. Breeding occurs from mid-April into early August. The female will incubate the eggs for 11 days and once hatched, both parents will tend to the young until fledging at 9-12 days. In recent years, the numbers of breeding pairs have declined drastically in many lowland areas where they were formerly common. (Cornell Lab of Ornithology 1999)

Yellow warblers are an expected spring and fall migrants but typically breed at higher elevation in the Sierra Nevada mountains. They are not expected to be found breeding within the BSA as recent breeding records in the valley are nearly non-existent. The implementation of **Biological Resources MM – 6** would ensure project related impacts to yellow warbler would be less than significant.

### *Migratory Birds and Raptors*

The federal Migratory Bird Treaty Act (MBTA) and California F.G.C. Sections 3503 and 3800 protect the occupied nests and eggs of migratory and non-game bird species. Birds nest in a variety of

places including trees, shrubs, man-made structures, and the ground. Work buffers around migratory birds and their nests are typically needed to minimize impacts to these species. Any proposed project must take measures to avoid the take of any migratory and non-game birds, nests, or eggs.

Numerous migratory bird species were observed during biological surveys. With the implementation of **Biological Resources MM-6** impacts to migratory birds and raptors would be less than significant.

#### *Hoary Bat*

The hoary bat (*Lasiurus cinereus*) is the most widespread of the North American bats (Shump and Shump 1982). It is typically solitary, winters along the coast and in southern California, and breeds inland and north of the winter range. Suitable breeding habitats include all woodlands and forests with medium to large-sized trees and dense foliage at elevations ranging from sea level to 13,200 feet. The hoary bat primarily feeds on moths; however, their diet can be varied and include any number of flying insects (Black 1974). They prefer open habitats or habitat mosaics with access to water, trees with dense foliage for cover and breeding, and open areas or habitat edges for feeding and foraging (Shump and Shump 1982). Their spring migration northward occurs from February to May, with the females preceding the males, and fall migration occurs from September to November (Shump and Shump 1982).

The habitat within BSA meets all the roosting, breeding and foraging needs of hoary bats and there are known occurrences approximately 3.8 miles from the BSA. It is likely that hoary bats occur within the BSA. The implementation of **Biological Resources MM – 7** would ensure project related impacts to hoary bat would be less than significant.

#### *Silver-Haired Bat*

The silver-haired bat (*Lasionycteris noctivagans*) is a medium sized bat with black or brown fur, tipped with silver. Females form small colonies that roost almost exclusively in trees, inside natural hollows and bird excavated cavities or under loose bark of large diameter snags. It has been observed that both the male and female silver-haired bats use multiple roosts within a limited area, indicating that clusters of large trees are necessary for the roosting needs of these bats. Foraging of numerous insects species, especially moths, occurs above the canopy, over open meadows, and in the riparian zone along water courses. The silver-haired bat is primarily a forest bat, associated with northern temperate zone conifer and conifer/mixed hardwood forests; however, they have been found in lower elevation, more xeric (dry) conditions, during winter and seasonal migration. As all bats are vulnerable to disruption while in torpor (state of decreased metabolic activity, similar to hibernation) in their winter hibernacula, actions to prevent roosting within the project site should be initiated prior to the end of October, or begin construction activities in early spring (Western Bat Working Group 2007).

All the roosting, breeding and foraging needs of silver-haired bats are met within the BSA. The closest known occurrence is over 10 miles from the BSA, however bats are excellent dispersers and it is conceivable that silver-haired bats could be found within the BSA. The implementation of **Biological Resources MM – 7** would ensure project related impacts to silver-haired bat would be less than significant.

#### *Western Red Bat*

The western red bat (*Lasiurus blossevillei*) is found in California from Shasta County to the Mexican border, west of the Sierra Nevada/Cascade crest and deserts. Winter range includes western lowlands and coastal habitats south of San Francisco. The western red bat roosts primarily in trees within forests and woodlands in edge habitats from sea level to mixed conifer forests (Williams and Findley

1979). However, the western red bat may have an association with riparian habitats with dense stands of cottonwood and sycamore, and orchards (Bolster, 1998). Family groups are known to roost together, forming nursing colonies. They forage in open areas and feed on a variety of insects including moths, crickets, beetles, and cicadas (Shump and Shump 1982). Migrations typically occur in the spring from March to May and in the autumn from September to October. The western red bat has been seen at temperatures as low as 44°F, however, in these cold climates the bat spends winter in hibernation (LaVal and LaVal 1979). Although suitable roosting habitat is present, no western red bats were observed within the project area. Implementation of **Biological Resources MM-7** will ensure potential impacts to western red bat would be less than significant.

#### *North American Porcupine*

The common porcupine is found throughout the Sierra Nevada and Cascades from Kern Co. north to the Oregon border, south in the Coast Ranges to Sonoma Co., and from San Mateo Co. south to Los Angeles Co. Scattered populations occur in wooded habitats throughout the Central Valley (Laurendine et al. 1996), as well as Los Angeles and San Bernardino counties. Common to fairly common throughout its range, but populations tend to be localized. Most common in montane conifer, Douglas-fir, alpine dwarf-shrub, and wet meadow habitats. Less common in hardwood, hardwood-conifer, montane and valley-foothill riparian, aspen, pinyon-juniper, low sage, sagebrush, and bitterbrush. In spring and summer, porcupines feed on aquatic and terrestrial herbs, shrubs, fruits, leaves, and buds. Winter diet consists of twigs, bark, and cambium of trees, particularly conifers, and evergreen leaves. Trees utilized include yellow pines, Douglas-fir, pinyon pine, lodgepole pine, western white pine, limber pine, bristle-cone pine, firs, oaks, maple, cottonwood, willow, and elderberry. Porcupines use caves, large rock crevices, hollow logs, trees for cover. (Taylor 1935, Woods 1973, Dodge 1982).

The habitat within the BSA cover, breeding and foraging needs of the North American porcupine and there is a record of the species within 500' of the BSA. It is likely that the North American porcupine occurs within the BSA. Implementation of **Biological Resources MM-8** will ensure impacts to North American porcupine would be less than significant.

- b) **Less Than Significant.** Although the project area contains riparian habitat, which could be considered a sensitive natural community by the USACE and CDFW. The proposed project will not temporarily and permanently impact riparian habitat as no vegetation removal is proposed as part of the project.
- c) **Less Than Significant with Mitigation.** A Draft Delineation of Waters of the U.S. (**Appendix C**) was prepared for the project site by NorthStar in January 2020. Pre-jurisdictional waters of the U.S. were delineated within the project area. The proposed project could affect Butte Creek, a perennial stream and a Waters of the U.S. In addition, the project would also be required to comply with FGC Section 1602, The following regulatory permits will be acquired prior to the start of any grading or construction activities within the project area:
  - CWA Section 404 permit #3 Maintenance from the USACE
  - CWA Section 401 Water Quality Certification from the RWQCB
  - F.G.C. Section 1602 Streambed Alteration Agreement from CDFW

Obtaining the appropriate regulatory permits ensures: 1) compliance with applicable state and federal laws, 2) that potential impacts to wetlands and waters of the U.S., waters of the state, and streambed and banks (including irrigation ditches), and listed species are mitigated appropriately (including the payment of mitigation fees), and 3) minimizes, reduces, or avoids potentially significant impacts.

Incorporation of **Biological Resources MM-1** would ensure that the county would obtain all required subsequent regulatory permits.

- d) **Less than Significant.** The proposed project would involve the routine removal of gravel upstream of the diversion, erosion repairs, and weir repair. Temporary disturbances resulting from gravel removal will be restored to pre-project conditions. The project would not result in the introduction of permanent barriers to movement of any resident or migratory fish or wildlife species, nor would it result in the introduction of any new long-term factors (light, fencing, noise, human/presence and/or domestic animals) which could hinder the normal activities of wildlife.
- e) **No Impact.** The proposed project would not conflict with any local plans or policies that protect biological resources. The project would be required to adhere to the mitigation measures and standard/permitting requirements of regulatory agencies, as set forth in this study.
- f) **No Impact.** The project site is not subject to the provisions of any adopted habitat conservation plans or natural community conservation plans, as Butte County has yet to complete the Butte Regional Conservational Plan. Regarding local plans, policies and ordinances, the proposed project would result in no impact.

#### 4.4.3 Mitigation:

##### **Biological Resources MM-1: Obtain Regulatory Permits and Implement Avoidance and Minimization Measures**

Additionally, the project will obtain the following permits, as necessary and applicable:

- CWA Section 404 permit #3 Routine Maintenance from the USACE
- CWA Section 401 Water Quality Certification from the RWQCB
- F.G.C. Section 1602 Streambed Alteration Agreement from CDFW
- The project will incorporate the avoidance and minimization measures (AMMs), standard BMPs and other notification requirements identified in applicable permits, such as pre- and post-construction surveys and documentation, worker awareness training, exclusionary measures, AMM compliance and reporting, incident reports and monitoring requirements.

##### **Biological Resources MM-2: Valley Elderberry Longhorn Beetle Avoidance and Minimization Measures**

- Environmental awareness training will be provided to all construction personnel. The training will be administered by a qualified biologist and will provide the workers with information on their responsibilities in regards to the sensitive biological resources in the BSA. The program will specifically address the status of VELB, the species life history, how to identify the species and its habitat, the need to protect the beetle and its host plant, and the project conservation and avoidance and minimization measures.
- ESA fencing will be erected around the shrub so it is clearly marked to ensure the proposed project will avoid the shrub entirely.

### **Biological Resources MM- 3: Anandromous Fish including Spring-run Chinook Salmon, Fall-run Chinook Salmon, and Central Valley Steelhead Avoidance and Minimization**

- The proposed project will adhere to a work window of mid-August to early September to avoid listed salmonids
- A berm will be left intact between the active channel of Butte Creek and the gravel extraction area to minimize potential siltation and turbidity. Additionally, silt fencing, straw wattle, and other siltation barriers will be utilized to minimize potential siltation from entering Butte Creek.

### **Biological Resources MM-4: Foothill Yellow-legged Frog Avoidance and Minimization Measures**

- Environmental awareness training will be conducted by a qualified biologist prior to onset of the work for construction personnel to brief them on how to recognize foothill yellow-legged frog and other special-status animals that may occur in the project area.
- Prior to construction a qualified biologist will conduct a pre-construction survey by a qualified biologist no more than 14 days before the start of construction.
- A biological construction monitor will be present during gravel removal with the ability to stop work should foothill-yellow legged frog be encountered.
- If foothill yellow-legged frogs are encountered in the BSA during construction and will be harmed by construction activities, work will stop in the area and the project proponent will notify CDFW. Upon authorization from CDFW, a qualified biologist may relocate the individual(s) the shortest distance possible to a location containing habitat outside of the project area.

### **Biological Resources MM-5: Northwestern Pond Turtle Avoidance and Minimization Measures**

- No later than 48 hours prior to any ground disturbance, pre-construction surveys will be conducted by a qualified biologist within the project limits.
- If a pond turtle is observed in the project limits during construction, all work will be stopped, and the turtle will: 1) be allowed to leave on its own volition, or 2) be moved by the project biologist in the direction it was heading (upstream or downstream), at a safe distance from the construction activities, and at a safe location. The biologist will report observations and relocations to CDFW.

### **Biological Resources MM-6: Bald Eagle, Osprey, Yellow warbler, and Migratory Birds Avoidance and Minimization Measures**

- If species covered under the Migratory Bird Treaty Act and Fish and Game Code sections 3503, 3503.5, and 3513 are determined to be present within the project vicinity, construction activity including clearing of vegetation, generation of mechanical noise, or ground disturbance should be conducted outside of the breeding season (February 1 to August 31), if feasible.
- If Project activities must be conducted during the nesting bird season, then the following shall be conducted:
  - A qualified biologist will conduct a pre-construction survey of the BSA, and within an appropriate distance from the BSA boundary, as access is available. The pre-construction survey will be performed no more than 14 days prior to the implementation of construction activities.

- If active nests are found during the pre-construction survey, the qualified biologist will establish buffer zones around active nests that are sufficient in size to ensure impacts to nesting species are avoided. Active nests shall be monitored at reasonable intervals, as determined by the qualified biologist. The buffer zone will be marked with flagging, stakes, or other means to mark the boundary and project activities will be prohibited within the buffer zone until the young have fledged or the nest has failed as determined by a qualified biologist. All construction personnel will be notified of the existence of the buffer zone and shall avoid entering the buffer zone during the nesting season.

#### **Biological MM-7: Bat Avoidance and Minimization Measures**

It is anticipated that no vegetation removal will be necessary and therefore, no monitoring or pre-construction surveys are anticipated. In the event vegetation removal is necessary, a pre-construction bat survey shall be conducted by a qualified biologist for the presence of any roosting bats on-site during the appropriate time of day to maximize detectability. The survey should be conducted within 14 days prior to commencement of vegetation removal activities. The survey methodology may include visual surveys of bats (e.g. observations of bats during foraging period), inspection of suitable habitat or signs of bat presence (e.g. guano, urine staining, vocalizations, etc.). The type of survey will depend on the condition of the potential roosting habitat.

Any vegetation that has been identified as potential roosting habitat must be removed between October 1 and February 28. If trees must be removed during the maternity roosting season (March 1 to September 30), a qualified biologist shall conduct a pre-construction survey to identify those trees proposed for disturbance that could provide hibernacula or nursery colony roosting habitat for bats. Trees identified as potentially supporting an active nursery shall be inspected by a qualified biologist no greater than 7 days prior to disturbance to determine presence or absence of roosting bats. Trees determined to support active maternity roosts will be left in place until the maternity season (September 30) or until the qualified biologist determines the bats are no longer present.

#### **Biological MM-8: North American Porcupine Avoidance and Minimization Measures**

- A pre-construction survey will be performed to detect if North American porcupine is present. In the case a North American porcupine is observed in the project area during construction activities, project personnel will temporarily halt project activities until the porcupine has moved, under its own volition, to a safe location outside of the limits of the project area.

### **4.5 Cultural Resources and Tribal Cultural Resources**

<b>Would the project:</b>	<b>Potentially Significant</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant</b>	<b>No Impact</b>
a) Cause a substantial adverse change in the significance of an archaeological resource pursuant to CA Code of Regulations, §15064.5?			<b>X</b>	
b) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		<b>X</b>		
c) Disturb any human remains, including those interred outside of formal cemeteries?		<b>X</b>		

<b>Would the project:</b>	<b>Potentially Significant</b>	<b>Less Than Significant With Mitigation</b>	<b>Less Than Significant</b>	<b>No Impact</b>
d) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:			<b>X</b>	
i.) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or			<b>X</b>	
ii.) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe			<b>X</b>	

#### 4.5.1 Setting

A record search for existing archaeological sites and surveys on the project site and a 1/8-mile radius surrounding the area of potential effect (APE) was conducted by Sean Jensen of Genesis Society through the Northeast Information Center (NEIC) of the California Historical Resources Information System on December 28, 2019. Additionally, an intensive pedestrian survey was conducted within the project area by Sean Jensen of Genesis Society. The pedestrian survey was conducted on February 1 and 2, 2020. No special problems were encountered and all survey objectives were satisfactorily achieved. The pedestrian survey involved walking parallel transects along the entire Area of Potential Effect (APE) and searching the ground surface for any evidence of cultural resources. No evidence of prehistoric or occupation was observed during the pedestrian survey.

Genesis Society prepared a Draft Archaeological Survey Report (ASR) for the project to identify potentially significant cultural resources located in or within 0.5 miles of the proposed project's Area of Potential Effect (APE). The Draft ASR included background research, a record search conducted at the Northeast Information Center (NEIC), a search of the Native American Heritage Commission's (NAHC) sacred lands file, outreach to Native American Tribes, individuals, or organizations identified by the NAHC that may have knowledge about the area, and a pedestrian survey of the APE.

Two potentially historic era resources were identified within the APE, the Parrot-Phelan Diversion and Crouch Ditch. The diversion dam is estimated to have been constructed sometime in the early 1900's and was and still is utilized for irrigation of crops west of the City of Chico. Several major modifications have been made to the diversion dam and associated structures including, a fish screen with a capacity of 150 cfs within the diversion constructed in 1995 and a fish ladder at the diversion dam with a capacity of 300 cfs constructed in 1996. The Crouch Ditch appears to have been constructed in the early 1900's, it is an

earthen lined ditch that extended approximately 11 miles from its origin at the diversion on Butte Creek, through south Chico, and into various farms. Subsequent urbanization of Chico effectively required re-routing waters originally transported along the ditch. The re-routing was accomplished at least in part, via releasing water into Comanche Creek.

#### 4.5.2 Discussion

- a) **Less than Significant.** The archaeological field survey was conducted on January 20, 2020 by Sean Jensen of Genesis Society. The survey resulted in the identification of two potentially historic era sites, the Parrot-Phelan Diversion and Crouch Ditch. According to files received from the NEIC the Parrot-Phelan Diversion Dam had not been previously recorded. As part of Genesis Society's ASR, Mr. Jensen recorded the diversion dam and made a determination of its eligibility for the National Register of Historic Places (NRHP). Over the past 100 years, the Parrot-Phelan Diversion has undergone a number of modifications including the installation of a fish ladder and fish screens. Consequently, the only components of integrity that to continue to exist are location and setting, the other components are severely compromised. Considering the site integrity has been dramatically compromised by contemporary additions to the diversion, the site is not considered significant per the criteria for inclusion in the NRHP, and is therefore not considered a significant historical resources or unique archaeological resource. Crouch Ditch has been previously recorded by Enbring and Waechter (2017) west of the project site. Mr. Jensen recorded the section of ditch found near the diversion. Enbring and Waechter concluded their recorded sections were not eligible for inclusion in the NRHP for any of the evaluation criteria. They ultimately recommended the site eligible for inclusion in the California Register of Historic Resources under Criteria 1 and 2. However, they assert that the site's segments within Chico have been channelized or otherwise altered and the segments through their survey areas "have been mitigated through recordation and archival research". Mr. Jensen concluded Crouch Ditch within the survey area that contains the proposed project is not eligible for inclusion in the NRHP, its not associated with events that made significant contributions to the broad patterns of local or regional history or the cultural heritage of California or the U.S. The site is not associated with the lives of person's important to local, California, or national history. A large number of water conveyances have been well documented that duplicate the qualities of this ditch, it doesn't represent a distinct type and recovery work would not provide unique or unusual additional information above and beyond what already exists. The Crouch Ditch has been heavily modified over the last ~100 years through direct modification, expansion, abandonment, and rerouting and no longer maintains the original integrity making it ineligible for inclusion in the California Register of Historical Resources (CRHR). Therefore, neither the Parrott-Phelan Diversion nor the Crouch Ditch are considered significant historical resources or unique archaeological resources.

As part of the ASR, prepared for the project, Native American consultation was undertaken with the Native American Heritage Commission (NAHC) regarding sacred land listing for the property, and with the Native American representatives identified by the NAHC. The NAHC response, dated December 16, 2019 indicated that a search of the Sacred Lands Files failed to identify any sacred lands within the APE or project vicinity. The NAHC identified three Native American Tribes, letters were sent to each and all were requested to supply any information they may have concerning prehistoric sites or traditional use areas with, adjacent or near the project area. An email response was received from the Mechoopda Tribe on December 17, 2019 requesting more project information.

- b) **Less than Significant With Mitigation Incorporated.** The proposed project would not generate potentially significant impacts to any known cultural resources as stated previously. However, in the event paleontological resources or human remains are uncovered during work activities, pursuant to Health and Safety Code (§7050.5), the Coroner must be contacted if human remains are uncovered



during construction activities (See item d below). Previously unidentified human remains are subject to regulations set forth at the state and federal levels, including the CA Public Resources Code and the Native American Graves Protection and Repatriation Act (NAGPRA). Incorporation of **Cultural Resources MM-1** will ensure impacts to archaeological resources would be less than significant.

- c) **Less than Significant with Mitigation Incorporated.** No human remains were uncovered during the archaeological field survey. In the event human remains are uncovered during work activities, pursuant to Health and Safety Code (§7050.5), the Coroner must be contacted if human remains are uncovered during construction activities (See item d below). Previously unidentified human remains are subject to regulations set forth at the state and federal levels, including the CA Public Resources Code and the Native American Graves Protection and Repatriation Act (NAGPRA). Incorporation of **Cultural Resources MM-1** will ensure impacts to archaeological resources would be less than significant.
- d) **Less than Significant.** As discussed above there are two historical era sites present within the project area that were recorded as part of the ASR, the Parrott-Phelan Diversion and Crouch Ditch. It was concluded that neither site is eligible for inclusion in either the NRHP or the CRHR. In the unlikely event that undiscovered resources are uncovered during the proposed project activities the incorporation of **Cultural Resources MM-1** mentioned above would ensure impacts to archaeological resources would be less than significant.
  - i) **Less than Significant.** As previously noted, two historic era resources recorded during the pedestrian surveys conducted by Sean Jensen of Genesis Society on February 1 and 2, 2020. The sites include the Parrott-Phelan Diversion and the Crouch Ditch. These two sites were determined to be ineligible for listing on the NRHP and the CRHR. Therefore, they are not considered significant historical resources. There were no other historical resources discovered within the APE during the pedestrian survey.
  - ii) **Less than Significant.** As part of the ASR prepared for the project by the Genesis Society, a sacred lands file request with the NAHC and Native American Consultation with the identified tribes was conducted. Consultation letters were sent to three tribes on December 16, 2019 with follow up emails and phone calls. Tribes contacted included the Mooretown Rancheria of Maidu Indians, the Konkow Valley Band of Maidu, and the Mechoopda Indian Tribe. Kyle McHenry of the Mechoopda Tribe responded on December 17, 2019 requesting more information on the project and Mr. Jensen provided the additional information and asked for more specific information regarding known cultural resources. Mr. McHenry responded two days later and stated the Tribe is not comfortable releasing information until they understand the scope of the project. No other cultural resources were identified within the project site or vicinity during the records search or pedestrian survey.

#### 4.5.3 Mitigation:

##### **Cultural Resources MM-1: Disturbance of Prehistoric Resources**

If unknown resources are discovered during project activities, the following Cultural Resources Mitigation Measures will be included in all contract documents and construction plans.

- Should archaeological resources be encountered at any point during project activities, all activity around the discovery will cease. The project proponent will retain the services of a qualified archaeologist to examine the findings, assess their significance, and offer proposals for any exploratory procedures deemed appropriate to further investigate and/or mitigate any adverse impacts.

- Should human remains be encountered during excavation activities in the project area, the following procedures shall be followed:
  - Per Health and Safety Code §7050.5(b), the Butte County Coroner's Office will be contacted immediately; all work must cease, no further disturbances may occur until the Coroner has made findings as to the origins and disposition per Public Resources Code §5097.98.
  - If the Coroner determines the remains are Native American, the Office will notify the Native American Heritage Commission (NAHC) within 24 hours.
  - Following receipt of the Coroners notice, the NAHC will contact a Most Likely Descendent (MLD). The MLD will then have 48 hours in which to make recommendations to the County and the consulting archaeologist regarding the treatment and/or re-interment of the human remains and any associated grave items.

## 4.6 Energy

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?				X
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?				X

### 4.6.1 Discussion

- a) **No Impact.** The proposed project will not result in any potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation. Construction energy consumption would largely occur from fuel consumption by heavy equipment during gravel removal, transportation of materials to and from the site, and construction worker trips to and from the project site. Energy consumption during construction related activities would vary substantially depending on the level of activities, length of construction period, construction operations, type of equipment used, and number of personnel present. Despite this variability, the overall scope of construction is low and would be completed quickly as past gravel removal has generally taken a few days at most. Increasingly stringent state and federal regulations regarding engine efficiency combined with state, local, and federal regulations limiting engine idling times and recycling of construction debris, would further reduce the amount of transportation fuel demand during construction.

The proposed project is gravel removal, weir repairs, and erosion repair, as such, it will not use any energy resources during operation.

- b) **No Impact.** Many of the state and federal regulations regarding energy efficiency focus on increasing building efficiency and renewable energy generation, as well as reducing water consumption and vehicle miles traveled. The proposed project includes conservation measures to meet or exceed the regulatory requirements including limiting idling time of heavy equipment during construction activities. The project will comply with Butte County Air Quality Management District standards regarding engine efficiency and limiting idling time during project construction.

#### 4.6.2 Mitigation: *None Required*

### 4.7 Geology and Soils

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i.) Rupture of a known earthquake fault, as delineated on the Alquist-Priolo Earthquake Fault Zoning Map for the area or based on other substantial evidence of a known fault?				X
ii.) Strong seismic ground shaking?				X
iii.) Seismic-related ground failure/liquefaction?				X
iv.) Landslides?				X
b) Substantial soil erosion or the loss of topsoil?			X	
c) Located on a geologic unit or soil that is unstable, or would become unstable as a result of the project, and potentially result in landslide, lateral spreading, subsidence, liquefaction or collapse?				X
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				X
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				X

#### 4.7.1 Setting

The Seismic and Geologic Hazards section of the Butte County General Plan indicates that all of Butte County is in Moderate Earthquake Intensity Zone VIII. The project site is not within an Alquist-Priolo Earthquake fault zone or an aftershock zone. The only known active fault within Butte County is the Cleveland Hill fault, located approximately 22 miles southeast of the project site, where activity on August 1, 1975 resulted in the Oroville earthquake. The 1975 Oroville earthquake registered a Richter magnitude of 5.7 and resulted in approximately 2.2 miles of ground rupture along the western flank of Cleveland Hill.

### Geologic Hazards

#### *Expansive Soils*

Expansive soils possess a “shrink-swell” behavior. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in fine-grained clay sediments from the process of wetting and drying. Structural damage may occur over a long period of time, usually the result of inadequate soil and foundation engineering or the placement of structures directly on expansive soils. The Health and Safety Element Figure HS-8 of the Butte County General Plan identifies the project site as having a “very low” potential of expansive soils.

## ***Soil Erosion***

Erosion is the wearing away of soil and rock by processes such as wind and precipitation runoff. Soils containing high amounts of silt or clay can be easily erodible, while sandy soils are less susceptible. Excessive soil erosion can eventually lead to damage of building foundations and roadways. Typically, soil erosion potential is reduced once the soil is graded and covered with gravel, concrete, structures, asphalt, or a vegetative cover. The Health and Safety Element Figure HS-7 of the Butte County General Plan identifies the project site as having a “Slight” potential for soil erosion.

## ***Landslides***

A landslide is the sliding of a mass of loosened rock and/or soil down a hillside or slope. Some of the natural causes of this instability are earthquakes, weak soils, erosion, heavy rainfall and fire. Human activities such as poor grading that undercuts steep slopes or overloads them will fill; excessive irrigation and removal of vegetation can also contribute to landslides. Most landslides in Butte County occur on slopes greater than 15 percent, and most new landslides occur in areas that have experienced previous landslides. The areas of highest landslide potential are in the mountainous central area of the county where well-developed soils overlay impervious bedrock on steep slopes. The remaining areas of Butte County have moderate to low landslide potential. The areas of lowest landslide potential are the flat lands of the Sacramento Valley. The Health and Safety Element Figure HS-6 of the Butte County General Plan identifies the project site as having “Moderate” landslide potential.

## ***Seismic Hazards***

### ***Surface Fault Rupture***

Seismically induced ground rupture is defined as the physical displacement of surface deposits in response to movement on the fault plane. The magnitude, sense, and nature of fault rupture can vary for different faults or event along different strands of the same fault. Ground rupture is considered more likely along active faults. The Cleveland Hills fault (located approximately 22 miles southeast of the project site) is the only fault located within Butte County that has been identified as an active fault pursuant to the Alquist-Priolo Earthquake Fault Zones Act. This fault was responsible for the 1975 Oroville earthquake, which had a Richter magnitude of 5.7 and produced surface displacement along approximately 2.2 miles of the fault. Other active and potentially active faults are located in the region. However, because there are no known active faults underlying or adjacent to the project site, the likelihood of surface fault rupture is very low and would not be a design consideration.

### ***Ground Shaking***

Ground shaking at the project site could occur due to earthquakes on the region’s active faults. However, ground motions attenuate with distance from the causative fault, as well as the local geologic and soil conditions. The Seismic Hazards Mapping Program of the California Geological Survey categorizes all of Butte County as a “seismic hazard zone” since the entire County is subject to earthquakes of Modified Mercalli Intensity scale VIII. The Oroville earthquake of 1975 is the only earthquake of this intensity recorded in Butte County. This earthquake resulted in structural damage, partial destruction of some buildings, fires and numerous injuries. Though, it is accepted that earthquakes of magnitude 6.0 or 6.5 are possible anywhere in Butte County, the county is generally considered to be an area of low seismic activity.

### ***Liquefaction***

Liquefaction is a phenomenon whereby unconsolidated and/or near saturated soils lose cohesion and are converted to a fluid state as a result of severe vibratory motion. The relatively rapid loss of soil shear strength during strong earthquake shaking results in the temporary fluid-like behavior of the soil. Soil liquefaction causes ground failure that can damage roads, pipelines, underground cables, and building with shallow foundations. Liquefaction can occur in areas characterized by water-saturated, cohesionless, granular materials at depths less than 50 feet. Due to the relatively low potential for strong ground motions and a general lack of significant deposits of saturated loose soils, such as alluvium, the liquefaction potential, if any, can be addressed in the design of future structures during the building permit review process.

### ***Seiches***

A seiche is a periodic oscillation of a body of water such as a reservoir, river, lake, harbor, or bay resulting from seismic shaking or other causes such as landslides into a body of water. The period of the oscillation varies depending on the size of the body of water and may be several minutes to several hours. Depending on the magnitude of the oscillations, seiches can cause considerable damage to dams, levees and shoreline facilities. Seiches have not been recorded in any of the reservoirs in Butte County that are within the jurisdiction of the California Division of Dam Safety. However, the potential for seiches does exist in Butte County, either from landslides or from stronger earthquakes that have been experienced in historical times.

#### **4.7.2 Discussion**

##### **a) No Impact.**

- i & ii)** The site is not within an Alquist-Priolo Earthquake fault zone and is not within an aftershock epicenter region. There is one known active fault in Butte County. The nearest active fault is the Cleveland Hill fault zone, located approximately 22 miles southeast of the project site near Lake Oroville. Like most of Central California, the site can be expected to be subjected to seismic ground shaking at some future time. However, active faults are quite distant from the project site and ground shaking due to a seismic event is expected to have a lower intensity at the project site. As the project appears to be located such that the probability of significant ground shaking is low, and because the project does not propose the addition of significant structures that would be at risk to seismic activity, potential geologic impacts would be less than significant.
- iii)** According to the Butte County General Plan, Butte County is in a relatively inactive seismic area. During the past 100 years, the County has experienced only one larger earthquake within its boundaries. Additionally, the project area has a flat slope, creating a less than significant impact regarding risk of damage from earthquakes. Since the project site occurs in a relatively seismically inactive area the potential for liquefaction is very low.
- iv)** The potential for landslides on the project site is considered remote due to the lack of significant topography on the project site and on the surrounding parcels.

- b) Less than Significant.** During project activities, specific erosion control and surface water protection methods would be implemented within the project site, such as straw wattles and silt fencing, covering materials and dumpsters, storing fuel and other potentially hazardous materials away from channel, and the use of erosion control seeding. These control measures are standard in the construction industry and are commonly utilized to minimize soil erosion and water quality degradation. The project will have a less than significant impact on loss of top soil.

- c) **No Impact.** The project will not expose people or structures to potential substantial adverse effects due to rupture or a known earthquake fault, seismic ground shaking, seismic-related ground failure including liquefaction. The project will not result in on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse. The project site would not be subject to landslide free zone due to its relative flat topography and gently sloping hills
- d) **Less than Significant.** The soil present within the project site consists primarily of Xerorthents, Tailings 0-50 percent slopes which consists of gravels and sandy loams. The site is not located on expansive soil and would not create substantial risks to life or property.
- e) **No Impact.** The project will not utilize septic tanks or an alternative wastewater disposal system on the site. Therefore, the proposed project will not result in an impact due to soils incapable of adequately supporting septic systems.

#### 4.7.3 Mitigation: *None required.*

### 4.8 Greenhouse Gas Emissions

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Generate greenhouse gas emissions, directly or indirectly, that may have a significant impact on the environment?			X	
b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?			X	

#### 4.8.1 Setting

The earth's atmosphere naturally contains a number of gases, including (but not limited to) carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O), which are collectively referred to as greenhouse gases (GHGs). GHG emissions are generally numerically depicted (when applicable) as carbon dioxide equivalents (CO<sub>2</sub>e). CO<sub>2</sub>e represents CO<sub>2</sub> plus the additional warming potential from CH<sub>4</sub> and N<sub>2</sub>O. The common unit of measurement for carbon dioxide equivalents is in metric tons (MTCO<sub>2</sub>e).

These gases trap some amount of solar radiation and the earth's own radiation, preventing it from passing through earth's atmosphere and into space. Greenhouse gases (GHG) are vital to life on earth; without them, earth would be an icy planet. For example, CO<sub>2</sub> is an element that is essential to the cycle of life. In general, CH<sub>4</sub> and N<sub>2</sub>O have 21 and 310 times the warming potential of CO<sub>2</sub>, respectively. Human-made emissions of GHG occur through the combustion of fuels, as well as a variety of other sources.

Section 15183.5(b) of Title 14 of the California Code of Regulations states that a GHG Reduction Plan, or a Climate Action Plan, may be used for tiering and streamlining the analysis of GHG emissions in subsequent CEQA project evaluation provided the CAP does the following:

- A. Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;
- B. Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable;

C. Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area;

D. Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;

E. Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels; and

F. Be adopted in a public process following environmental review.

A 2006 baseline GHG emission inventory was prepared for unincorporated Butte County. The inventory identified the sources and the amount of GHG emissions produced in the county. Within Butte County, the leading contributors of GHG emissions are agriculture (43%), transportation (29%), and residential energy (17%).

A Climate Action Plan (CAP) was adopted by Butte County on February 25, 2014. The CAP provides a framework for the County to reduce GHG emissions while simplifying the review process for new development. Measures and actions identified in the CAP lay the groundwork to achieve the adopted General Plan goals related to climate change, including reducing GHG emissions to 1990 levels by 2020.

In an effort to implement the measures of the CAP, a development checklist was created to evaluate a new projects consistency with the CAP, and to identify which GHG emission reduction measures would be implemented with project approval. The CAP development checklist identified three reduction measures applicable to the proposed project. These measures include expansion of renewable energy systems for new residential development by prewiring future development for photovoltaic systems; reduction of construction equipment idling time; and, installation of electric vehicle charging outlets in the garage or the exterior of the homes.

#### 4.8.2 Discussion

**a)-b) Less than Significant.** It is anticipated that project activities would generate short-term temporary GHG emissions associated with construction equipment. Examples of sources for construction related GHGs are equipment fossil fuel combustion, material transportation, and purchased electricity. See the BMP's discussed in Section 3, Air Quality, minimize temporary emissions associated with the construction activities.

#### 4.8.3 Mitigation: *None required.*

#### 4.9 Hazards and Hazardous Materials

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			X	
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			X	

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				X
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			X	
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?			X	

#### 4.9.1 Discussion

- a) **Less than Significant.** The proposed project would not involve the routine transport, use, or disposal of hazardous materials, and would not result in such impact. Construction activities associated with the project would include refueling and minor onsite maintenance of construction equipment, which could lead to minor fuel or oil spills. The use and handling of hazardous materials during project activities would occur in accordance with applicable federal, state, and local laws including CalOSHA requirements.
- b) **Less than Significant.** The proposed project would not result in new land uses when compared to existing conditions. The project would not construct dwellings, occupy structures, or result in land uses that could generate or emit hazardous materials. Project activities are not anticipated to result in a release of hazardous materials into the environment, or to create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions as stated previously the use and handling of hazardous materials during construction activities would occur in accordance with applicable federal, state, and local laws including California Occupational Health and Safety Administration (CalOSHA) requirements.



- c) **No Impact.** The proposed project does not involve any emission or handling of any hazardous materials, substances, or waste within one-quarter mile of an existing school. No existing or proposed school facilities are located within one-quarter mile radius of the project site. The nearest school is Little Chico Creek Elementary School located approximately 2.95 miles northwest of the project area. As stated previously, the use and handling of hazardous materials during construction activities would occur in accordance with applicable federal, state, and local laws including CalOSHA requirements.
- d) **No Impact.** The project is not included on a list of sites containing hazardous materials, and would not result in a significant hazard to the public or to the environment. The project site is not included on the Cortese list compiled pursuant to Government Code Section 65962.5. The nearest site containing hazardous materials is located approximately three miles west of the project area in Chico California.
- e) **No Impact.** The proposed project site is not located within two miles of a public airport. The nearest public airport is the Chico Municipal Airport located approximately 7.5 miles northwest of the project area.
- f) **No Impact.** The proposed project site is not located within the vicinity of a private airstrip and the project would not result in permanent structures that expose people to an airport or airstrip related safety hazard.
- g) **Less than Significant.** The proposed project does not include any actions within the roadways that would physically interfere with any emergency response or emergency evacuation plans. The project would not result in an increase in traffic, and thus would not significantly reduce the current level of service of the area road network.
- h) **Less than Significant.** The Fire Severity Zone Maps adopted by Cal Fire in 2007 identifies the project site as a Moderate Fire Hazard Severity Zone. The project does not involve the construction of significant structures that would be considered residential in nature, and thus would not expose people or associated structures to risk of loss, injury or death involving wildland fires. Additionally, project activities would follow all local, state, and federal regulations which ensure the potential for construction equipment to spark a wildland fire is minimal.

**Mitigation:** None required.

#### 4.10 Hydrology and Water Quality

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Violate any water quality standards or waste discharge requirements?			X	
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				X

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?				X
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?			X	
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?			X	
f) Otherwise degrade water quality?			X	
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?			X	
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?			X	
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?			X	
j) Inundation by seiche, tsunami, or mudflow?			X	

#### 4.10.1 Discussion

- a) **Less Than Significant.** As identified in Section 4.4 of this document (**Biological Resources MM-1**), the project will obtain all appropriate regulatory permits including certification from a RWQCB per Section 401 Water Quality Certification of the Clean Water Act prior to construction activities. A Section 401 permit is contingent on sufficient evidence that a project would not pose a threat to water quality or quantity leaving the proposed project's site. No additional mitigation measures are necessary. Additionally, the project would implement all applicable erosion control BMPs, which include but is not limited to: the installation of straw wattles, and silt fencing to prevent silt/sediment from entering the waterways, and re-seeding of disturbed upland areas post construction. As described in the Geology and Soils Section 4.7 of this document.
- b) **No Impact.** The proposed project involves the routine removal of gravel, erosion repair along the bank of Butte Creek, and scour repair at the existing weir and does not propose activities requiring increases in groundwater use. No new extraction wells or buildings with the potential to increase water usage are proposed.
- c) **Less Than Significant.** Project activities include the routine removal of gravel, erosion repair along the bank of Butte Creek, and repairs at the weir. The overall direction of drainage on the site will not

change. The implementation of standard BMPs during construction activities will minimize soil erosion and siltation. Additionally, the proposed project will not alter the existing drainage pattern of the site, including through the alteration of the course of Butte Creek in a manner that will result in substantial erosion or siltation on- or off-site

- d) Less than Significant.** NorthStar prepared a Hydraulic Study Memo for the project which analyzed potential changes in hydrological conditions based on proposed project activities. The HSR utilized the Hydraulic Engineering Center River Analysis System (HEC-RAS) to estimate the hydraulic conveyance capacity under project conditions. The Hydraulic Study Memo informed the sizing of the rock slope protection that should be utilized and concluded the addition of the new rock slope protection downstream of the existing weir will not result in additional flooding on or off-site.
- e)-j) Less than Significant.** The proposed project is located within two flood map boundaries (FIRM Map Numbers 0007C0501E and 06007C0530E effective 1/6/2011) and within a special flood hazard area AE which has a base flood elevation ranging from approximately 275 feet above sea level at the gravel removal area and approximately 267 feet at the existing weir. As previously mentioned, the project would not result in significant increases in the surface area of impervious materials or redirect flood flows. The project does not involve the construction of dwelling units and will not place housing within the flood hazard area. Furthermore, the project would not expose people or structures to significant loss, injury, or death involving flooding, including levee or dam failure. There are no anticipated impacts to the proposed project from seiche, tsunami, or mudflow, as no topographical features of water bodies capable of producing such events exist within the project site vicinity.

#### 4.10.2 Mitigation: *None Required*

#### 4.11 Land Use and Planning

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Physically divide an established community?				X
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				X
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				X

##### 4.11.1 Discussion

- a), b) No impact.** The project involves the routine removal of accumulated gravel, erosion repair along the bank of Butte Creek and scour repair at the existing weir and will not physically divide an established community. The proposed project would not conflict with an applicable land use plan, policy, or regulation of any agencies with jurisdiction adopted for the purpose of avoiding or mitigating an environmental effect. The project does fall within the Butte Creek Canyon Overlay Zone but is allowed under 24-79 Performance Standards of the Butte County Code.

- c) **No Impact.** The project will not have a substantial conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan as there are none adopted in Butte County.

**4.11.2 Mitigation:** *None required.*

**4.12 Mineral Resources**

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				<b>X</b>
b) Result in the loss of availability of a locally-important mineral resource recovery site on a local general plan, specific plan or other land use plan?				<b>X</b>

**4.12.1 Discussion**

- a), b) **No Impact.** The California Geological Survey's (Department of Conservation) map "Fifty-Year Aggregate Demand Compared to Permitted Aggregate Resources" (2018) does not identify extraction facilities near the project site. The General Plan and State of California Division of Mines and Geology Special Publication 132 do not list the site as having any substantial mineral deposits of a significant or substantial nature.

**4.12.2 Mitigation:** *None required*

**4.13 Noise**

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			<b>X</b>	
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?			<b>X</b>	
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			<b>X</b>	
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			<b>X</b>	
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				<b>X</b>

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				<b>X</b>

#### 4.13.1 Setting

The Health and Safety Element of the Butte County General Plan identifies land use compatibility standards for exterior community noise for a variety of sensitive land uses. For residential designations, a maximum allowable noise exposure level of 60 L<sub>dn</sub>/CNEL outdoors and 45 L<sub>dn</sub>/CNEL decibel level is generally identified as being an acceptable noise environment requiring no special noise insulation or noise abatement features. This standard is applicable to properties containing noise sensitive land uses are generally defined as locations where people reside or where the presence of unwanted sound could adversely affect the use of the land.

The Butte County Noise Control Ordinance provides the County with a means of assessing complaints of alleged noise violations and to address noise level violations from stationary sources. The ordinance includes a list of activities that are exempt from the provisions of the ordinance. Construction-related noise within 1,000 feet of residential uses are included among the exempted activities, provided construction activities do *not* take place:

- From sunset to sunrise on weekends and non-holidays;
- Fridays commencing at 6:00 pm through and including 8:00 am on Saturday;
- Before 8:00 am on holidays;
- Saturday commencing at 6:00 pm through and including 10:00 am on Sunday; and Sunday after 6:00 pm.

#### 4.13.2 Discussion

**a)-d) Less Than Significant.** The proposed project will be required to comply with all applicable rules, regulations and control measures including permitting, prohibitions and limits to emissions that work to reduce air pollution throughout California. The nearest residents to the project site are approximately 1,000 feet away. While construction activities would generate noise, it is anticipated at this distance noise levels would not exceed established acceptable levels. The project would be expected to comply with the noise ordinance with regard to allowable construction times and noise limits.

**e) No Impact:** The proposed project is not located within an airport land use plan area and is located over seven miles from the Chico Municipal Airport. The proposed project will not expose people residing or working in the project area to excessive noise levels associated with airport land uses.

**f) No Impact:** The proposed project is not located within two miles of a private airstrip and people residing or working in the project area will not be exposed to excessive noise levels generated by private airstrips.

#### 4.13.3 Mitigation: *None Required*

#### 4.14 Population and Housing

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				<b>X</b>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				<b>X</b>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				<b>X</b>

##### 4.14.1 Discussion

a)-c) **No Impact:** The proposed project involves gravel removal, erosion repairs and repairs to the existing weir in a more rural portion of Butte County. The proposed project will not induce substantial population growth in the area, directly or indirectly, or displace a substantial number of people or existing housing. The project will not displace people or housing nor necessitate the construction of replacement housing elsewhere. Therefore, the project will not impact population or housing.

##### 4.14.2 Mitigation: *None required*

#### 4.15 Public Services

Would the project: result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Fire protection?				<b>X</b>
b) Police protection?				<b>X</b>
c) Schools?				<b>X</b>
d) Parks?				<b>X</b>
e) Other public facilities?				<b>X</b>

##### 4.15.1 Discussion

a)-e) **No Impact.** The proposed project would not construct buildings, businesses or other facilities that would result in an increased population in the area. Temporary delays to traffic may occur during project activities. However, as required by state and local regulations, emergency vehicles will be

given the right-of-way in the event of their presence at the project site. There would be no long-term demands on public services such as fire protection, police protection, schools, or parks generated by this project. No changes in fire protection or police protection are proposed as part of this project. Therefore, the proposed project is not anticipated to impact public services.

#### 4.15.2 Mitigation: *None required*

### 4.16 Recreation

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				X

#### 4.16.1 Discussion

a), b) **No Impact.** This proposed project will not result in residential development that would result in the increase the use of existing neighborhood and regional parks or other recreational facilities including recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

#### 4.16.2 Mitigation: *None required*

### 4.17 Traffic and Transportation

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?			X	
b) Conflict with or be inconsistent with CEQA Guidelines section 15064.3 subdivision (b)?			X	

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X
e) Result in inadequate emergency access?			X	
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?				X

#### 4.17.1 Setting

Regional access to and from the project site is provided by State Route 99 (SR 99), Skyway, and Honey Run Road. In Chico, SR 99 is a north-south four lane freeway that runs through Chico, Biggs, and Gridley. Skyway is an east-west expressway that begins in the City of Chico near SR 99, continues through the Town of Paradise, and terminates in the unincorporated community of Butte Meadows. Skyway is approximately 1.3 miles west of the project area and is a divided four lane facility its intersection with Honey Run Road. Honey Run Road is a major two-lane collector that travels approximately east west from its intersection with the Skyway near the City of Chico to its endpoint in the Town of Paradise.

According to the Butte County General Plan EIR the peak PM hour volume for Honey Run Road from its intersection with Skyway to its intersection with Centerville Road was documented as 150 trips. Recent traffic counts conducted by the Butte County Association of Governments in 2017 and 2018 recorded an average daily traffic volume of 1404 vehicles with a peak AM hour volume of 146 vehicles and a peak PM hour volume of vehicles trips.

#### 4.17.2 Discussion

- a) **Less than Significant.** The proposed project involves routine gravel removal, erosion repair, and repairs to the existing weir. The project will not conflict with an applicable plan, ordinance or policy regarding the effectiveness of the performance of the circulation system. The proposed project would not generate additional sustained traffic, as it would not construct facilities or land uses that would generate additional vehicular traffic such as a retail center or residential subdivision. Temporary increases in traffic along Honey Run Road could occur during gravel removal, the increases in traffic would be temporary in nature as gravel removal activities are completed within a couple days.
- b) **Less than Significant.** The project will result in temporary increases to vehicular trips when gravel removal is conducted for approximately two to three days each year, the increased traffic will be minimal. It is anticipated the number of trips generated by the project will be approximately 100-200 dump haul trips over the course of the gravel removal. With a smaller number for worker trips and trips for erosion repair. Recent traffic counts on Honey Run Road have and average daily traffic



volume of 1404 vehicles with a peak volume in the morning of 146 and a peak volume in the afternoon of 136 vehicles. An additional 30-60 trips that are anticipated per day during project operations represents only a two to four percent increase in traffic on the road which would only occur during project operations which only last two to three days. Additionally, these trips would be spread out across the day thereby having only a minimal impact to peak traffic on Honey Run Road. The number of trips generated by the project will vary year to year and will not impact levels of service and trip distributions within the project area. The proposed project will not conflict with an applicable congestion management program and will not affect travel demand measures. Based on screening thresholds for small land use projects established in the Office of Planning and Research updated SB 743 Technical Advisory, project trips would be well below the significance threshold of 110 trips per day. Thus, the project would result in a less than significant impact to traffic and vehicle miles traveled.

- c) **No Impact.** The proposed project will not result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that will result in substantial safety risks. The project site is not located in the vicinity of a public airport which is over seven miles northwest of the project area. This project will not obstruct air traffic patterns.
- d) **No Impact.** The proposed project involves gravel removal, erosion repairs near the existing weir and repairs to the existing weir outside of the public right-of-way and will not increase hazards due to a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment).
- e) **Less than Significant.** During the gravel removal phase, emergency vehicle access to, and passage through, the project site would be ensured through adherence to applicable roadway and/or lane closures and standards. The project will be required to adhere to pertinent local and state construction site regulations. Thus, temporary traffic control activities during the construction phase of the proposed project would not prevent emergency vehicle movement throughout the area.
- f) **No Impact.** The proposed project will not conflict with an applicable plan, ordinance or policy regarding public transit, bicycle or pedestrian facilities because the project site is located in a rural area that does not have any provisions for alternative transportation. No impact is anticipated.

#### 4.17.3 Mitigation: *None required*

#### 4.18 Utilities and Service Systems

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Exceed wastewater treatment requirements of the applicable Water Quality Control Board?				<b>X</b>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				<b>X</b>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				<b>X</b>

Would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				X
e) Result in a determination by the wastewater treatment provider which serves/may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				X
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?				X
g) Comply with federal, state, and local statutes and regulations related to solid waste?				X

#### 4.18.1 Discussion

**a)-e) No Impact.** This project proposes replacing an existing bridge over Stony Creek, with a new wider bridge of similar size. The new bridge will not significantly increase the amount of impervious surfaces in the area, and will not increase the surface runoff of the area. All work will be conducted within the existing right-of-way, and will not require additional water supplies or entitlements. The project will not result in exceeding wastewater treatment requirements for the applicable RWQCB or result in the need for new wastewater treatment facilities because the project is not a use that generates wastewater.

**f), g) No Impact.** The proposed project would not generate impacts relative to landfill capacity, wastewater treatment or solid waste generation. Therefore, there would be no impact.

#### 4.18.2 Mitigation: *None required*

#### 4.19 Wildfire

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?			X	
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?			X	
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?			X	

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?			X	

#### 4.19.1 Setting

The project site is designated as a moderate fire hazard by the State Department of Forestry and Fire Protection; however, the proposed project site is located in the footprint of the Camp Fire. The project site is also within a designated State Responsibility Area (SRA), which means the state jurisdiction has fiscal responsibility for preventing and suppressing wildfires.

#### 4.19.2 Discussion

- a) **Less than Significant.** The project will not impair an adopted emergency response plan or evacuation plan. The road will be open to traffic during the project and would not constrict access for emergency vehicles.
- b) **Less than Significant.** The project site is located approximately 1.43 miles east of Chico, CA and the topography of the site is relatively flat to gently sloping and will not expose project occupants to pollution concentrations from a wildfire. The project is located within the footprint of the Camp Fire, the worst fire in California's history. The fire burned through the project area in November 2018, there is very little fuel left within the project area and surroundings that could contribute to wildland fire conditions or the exacerbation thereof. No conditions or factors have been identified in the project area that would exacerbate wildfire risks.
- c) **Less Than Significant.** The proposed project involves routine gravel removal, erosion repair, and repairs to the existing weir. Project activities will comply with all applicable local, state, and federal public resource codes, therefore, construction would not exacerbate a fire risk.
- d) **Less than Significant.** The proposed project is located on the edge of the Central Valley and the majority of the project site contains slopes between 0 and 10 percent, although small steeper slopes exist adjacent to the project area. The project area does not exhibit landslide potential, nor does it exhibit flood potential due to the wide channel as well as previously constructed flood bypass structures that have been constructed adjacent to the project area being able to pass any potential high flow events within the channel. Therefore, no impacts from post fire instability or drainage changes have been identified.

#### 4.19.3 Mitigation: *None Required*

## 5 Mandatory Findings of Significance

Mandatory Findings of Significance	Potentially Significant	Less Than Significant With Mitigation	Less Than Significant	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		X		
b) Does the project have impacts that are individually limited, but cumulatively considerable (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?				X
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?				X

### 5.1.1 Discussion

- a) **Less Than Significant with Mitigation Incorporated.** With the implementation of the mitigation measures included in this Initial Study, **Air Quality MM-1, Biological Resources MM-1 through MM-8 and Cultural Resources MM-1**, the proposed project would not degrade the environment; result in an adverse impact on fish, wildlife, or plant species including special status species, or prehistoric or historic resources.
- b) **No Impact.** The project involves the routine removal of gravel to protect the diversion, the repair of erosion, and repairs to the weir structure. The project does not involve the addition of new expanded structures, facilities, or growth inducing effects, which would be considered cumulatively considerable with regards to past or future projects.
- c) **No Impact.** Based on the preceding environmental analysis and adherence to applicable local, state and federal regulations, as noted in this document, the proposed project would not result in potentially significant cumulative, direct or indirect adverse effects on human beings.

## 6 Preparers and References

---

### 6.1 Report Preparation and Review

Mark Wolfe, Principle Planner, NorthStar, Reviewer

Les Heringer, General Manager, Reviewer

Matt Rogers, Associate Environmental Planner/ Biologist, NorthStar, Preparer

### 6.2 References

Baldwin, B.G., D.H Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken, editors. 2012. *The Jepson Manual: Vascular Plants of California, Second Edition*. University of California Press, Berkeley, CA.

Butte County Association of Governments. *Butte Regional Conservation Plan, Formal Public Draft Draft*. Accessed December 2019. (available at <http://www.buttehcp.com/BRCP-Documents/Formal-Public-Draft-BRCP/index.html>)

Butte County Association of Governments. *2017/2018 Traffic Counts*. Accessible at [www.bcag.org/documents/demographics/traffic\\_counts/BCAG\\_Traffic\\_Counts\\_2018\\_final\\_web.pdf](http://www.bcag.org/documents/demographics/traffic_counts/BCAG_Traffic_Counts_2018_final_web.pdf)

Butte County. *Butte County Airport Land Use Compatibility Plan*. Butte County Airport Land Use Commission. December 20, 2000.

Butte County. *Butte County Climate Action Plan*. February 25, 2014.

Butte County. *Butte County General Plan 2030 Draft Environmental Impact Report*.

Butte County. *Butte County General Plan 2030 Final Environmental Impact Report*. April 8, 2010.

Butte County. *Butte County General Plan 2030*. Adopted October 26, 2010.

Butte County. *Butte County Code of Ordinances*: Accessed December 2019. Available at: [http://www.municode.com/library/ca/butte\\_county/codes/code\\_of\\_ordinances/](http://www.municode.com/library/ca/butte_county/codes/code_of_ordinances/)

Butte County Air Quality Management District. *CEQA Air Quality Handbook – Guidelines for Assessing Air Quality and Greenhouse Gas Impacts for Projects Subject to CEQA Review*. October 23, 2014.

California Air Pollution Control Officers Association. California Emission Estimator Model (CalEEMod) version 2016.3.2

California Department of Conservation. *Fault Activity Map of California Map*. Accessed December 2019. Available at: [maps.conservation.ca.gov/cgs/fam/](http://maps.conservation.ca.gov/cgs/fam/)

California Department of Conservation. *California Important Farmland Finder*. Accessed December 2019. Available at: [maps.conservation.ca.gov/ciff/ciff.html](http://maps.conservation.ca.gov/ciff/ciff.html)

California Department of Conservation. 2012. *Fifty-Year Aggregate Demand Compared to Permitted Aggregate Reserves*. Available at [www.conservation.ca.gov/cgs/information/publications/ms/Documents/MS\\_52\\_2012.pdf](http://www.conservation.ca.gov/cgs/information/publications/ms/Documents/MS_52_2012.pdf)

California Department of Fish and Wildlife. 2019. *California Natural Diversity Database*. Accessed via RareFind 5.

- California Native Plant Society. Rare Plant Program. 2019. *Inventory of Rare and Endangered Plants* (online edition, v8-03) Sacramento, CA. Available at <http://www.rareplants.cnps.org>
- California Department of Toxic Substance Control. 2009. *Envirostor Database*. Accessed December 2019. Available at: <http://www.envirostor.dtsc.ca.gov/public>
- Federal Emergency Management Agency. 2016. *FEMA Flood Map Service Center*. Accessed December 2019. Maps 06007C0510E and 06007C0530E. Available at: <https://msc.fema.gov/portal>
- Natural Resources Conservation Service. 2006. *Soil Survey of Butte Area, California, Parts of Butte and Plumas Counties*.
- NorthStar. 2020. *Biological Resources Assessment for the Parrott-Phelan Restoration and Maintenance Project*.
- NorthStar. 2020. *Biological Assessment for the Parrott-Phelan Restoration and Maintenance Project*.
- NorthStar. 2020. *Draft Aquatic Resources Delineation for the Parrott-Phelan Restoration and Maintenance Project*.
- NorthStar. 2020. *Hydraulic Study Memo*.
- State Water Resources Control Board. *GeoTracker Database*. Available at <https://geotracker.waterboards.ca.gov>
- Western Regional Climate Center. 2019. *Chico, California, Period of Record General Climate Summary-Temperature and Precipitation, Station (041715) CHICO EXPERIMENT STN, From Year=1906 to Year=2012*.
- U.S. Department of Agriculture. 2019. *Web Soil Survey*. Available online at: [websoilsurvey.sc.egov.usda.gov/App/HomePage.htm](http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)
- United States Fish and Wildlife Service. *Information for Planning and Consultation*. Available at <https://ecos.fws.gov/ipac>

## 7 Acronyms and Abbreviations

---

### Agencies, Boards, Commissions, Districts:

CAAQS.....	California Ambient Air Quality Standards
Caltrans.....	California Department of Transportation
CARB.....	California Air Resources Board
CDFW.....	California Department of Fish and Wildlife
CDWR.....	California Department of Water Resources
DTSC.....	(California) Department of Toxic Substances Control
EPA.....	Environmental Protection Agency
FEMA.....	Federal Emergency Management Agency
NAHC.....	Native American Heritage Commission
NSVAB.....	Northern Sacramento Valley Air Board
RWQCB.....	Regional Water Quality Control Board
USACE.....	United States Army Corps of Engineers
USFWS.....	United States Fish and Wildlife Service
USGS.....	United States Geological Survey

### Guidelines, Policies, Programs, Regulations:

CEQA.....	California Environmental Quality Act
CESA.....	California Endangered Species Act
CWA.....	Clean Water Act
ESA.....	Endangered Species Act
FGC.....	Fish and Game Code
MBTA.....	Migratory Bird Treaty Act
NESHAP.....	National Emission Standards for Hazardous Air Pollutants
NHPA.....	National Historic Preservation Act
NPDES.....	National Pollution Discharge Elimination System
NRHP.....	National Registry of Historic Places
SIP.....	State Implementation Plan

### Miscellaneous:

APE.....	Area of Potential Effect
ASR.....	Archaeological Survey Report
BMPs.....	Best Management Practices
BSAs.....	Biological Study Areas
Cm.....	Centimeter
CNDDDB.....	California Natural Diversity Database
CNEL.....	Community Noise Equivalent Level
CNPS.....	California Native Plant Society
CO.....	Carbon Monoxide
ESAs.....	Environmentally Sensitive Areas
FIRM.....	Flood Insurance Rate Map
GHG.....	Green House Gases
ISA.....	Initial Site Assessment
MLD.....	Most Likely Descendant
NES.....	Natural Environmental Study
NOx.....	Nitrogen oxides
PM <sub>10</sub> / 2.5.....	Particulate Matter less than 10 / 2.5 Microns

ROG ..... Reactive Organic Gases  
RSP ..... Rock Slope Protection



## Mitigation Measures and Monitoring Requirements

Parrott-Phalen Diversion Dam (CEQA20-0001)

---

### Project Sponsor(s) Incorporation of Mitigation into Proposed Project

I/We have reviewed the Initial Study for the Parrott-Phalen Diversion Dam (CEQA20-0001) application and particularly the mitigation measures identified herein. I/We hereby modify the applications on file with the Butte County Planning Department to include and incorporate all mitigations set forth in this Initial Study.

M&T Chico Ranch  
dba: Parrott Phelan Diversion Dam

Project Sponsor/Project Agent

Date

by: 

3/23/2021

Project Sponsor/Project Agent

Date

Les Heringer Jr.

---

**Butte County Department of Development Services – Planning Division**

7 County Center Drive

Oroville, CA 95928

530.552.3700





## Appendix A

### Site Photos

---





PHOTO 1 -

Parrott-Phelan  
Restoration and  
Maintenance Project.

Accumulated gravel  
upstream of the  
diversion.

Standing on the north  
bank of Butte Creek,  
facing west  
(downstream).

12 August 2019



PHOTO 2 -

Parrott Phelan  
Restoration and  
Maintenance Project.

Accumulated gravel  
upstream of the  
diversion (right side  
of photo).

Standing within the  
channel of Butte  
Creek facing east.  
(upstream).

12 August 2019





PHOTO 3 -

Parrott-Phelan  
Restoration and  
Maintenance Project.

Upstream end of the  
accumulated gravel  
found above the  
diversion.

Standing near the  
north bank of Butte  
Creek facing  
southwest  
(downstream).

12 August 2019



PHOTO 4 -

Parrott Phelan  
Restoration and  
Maintenance Project.

Downstream of  
diversion showing  
accumulated gravel  
on left of photos and  
weir and fish ladder  
on right.

Standing on the south  
bank of Butte Creek  
facing north.

12 August 2019





PHOTO 5 -

Parrott-Phelan  
Restoration and  
Maintenance Project.

Erosion on southern  
bank downstream of  
diversion on left side  
of picture.

Accumulated gravel  
seen on right side.

Standing on south  
bank of Butte Creek  
facing southwest  
(downstream).

12 August 2019



PHOTO 6 -

Parrott Phelan  
Restoration and  
Maintenance Project.

Gravel accumulation  
around fyke outfall  
(red arrow) pipe in  
mid photo and bank  
erosion present on  
opposite bank on right  
side of photo. Weir  
and fish ladder  
present in  
background.

Standing on the north  
bank of Butte Creek  
facing upstream.

12 August 2019





PHOTO 7 -

Parrott-Phelan  
Restoration and  
Maintenance Project.

Fish ladder and weir  
immediately  
downstream of the  
diversion.

Standing on north  
bank of Butte Creek  
facing upstream.

12 August 2019



PHOTO 8 -

Parrott-Phelan  
Restoration and  
Maintenance Project.

Bank erosion on right  
side of picture and  
accumulated gravel  
on right just  
downstream of weir  
and fish ladder.

Standing on the south  
bank of Butte Creek  
facing upstream.

12 August 2019

## Appendix B

### CalEEMod Output

---



## Parrot-Phelan - Butte County, Annual

**Parrot-Phelan**  
**Butte County, Annual**

## 1.0 Project Characteristics

---

### 1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	0.00	Acre	0.75	32,670.00	0

### 1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	71
Climate Zone	3			Operational Year	2021
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - Project activities commence Sept 2020 and gravel removal continues each year after

Land Use - Disturbed area approximately 0.75 acres.

Construction Phase - Gravel removal takes approximately 2-3 days as would erosion repair

Off-road Equipment - Equipment used excavator and dump haul truck

Trips and VMT - Estimate number of haul trips based on past removals. Haul length limited to Knife River yard

Energy Use -

Water And Wastewater - No operational component to project

Construction Off-road Equipment Mitigation - Equipment utilizing new engine tier

## Parrot-Phelan - Butte County, Annual

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	1.00	6.00
tblConstructionPhase	PhaseEndDate	9/15/2020	9/8/2020
tblConstructionPhase	PhaseStartDate	9/15/2020	9/1/2020
tblLandUse	LandUseSquareFeet	0.00	32,670.00
tblLandUse	LotAcreage	0.00	0.75
tblOffRoadEquipment	HorsePower	158.00	187.00
tblOffRoadEquipment	HorsePower	16.00	97.00
tblOffRoadEquipment	LoadFactor	0.38	0.41
tblOffRoadEquipment	LoadFactor	0.38	0.37
tblOffRoadEquipment	OffRoadEquipmentType	Graders	Excavators
tblOffRoadEquipment	OffRoadEquipmentType	Tractors/Loaders/Backhoes	Dumpers/Tenders
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	1.75
tblTripsAndVMT	HaulingTripNumber	0.00	60.00
tblTripsAndVMT	WorkerTripNumber	18.00	13.00

## 2.0 Emissions Summary

## Parrot-Phelan - Butte County, Annual

**2.1 Overall Construction****Unmitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	3.0900e-003	0.0375	0.0191	6.0000e-005	1.9900e-003	1.2600e-003	3.2600e-003	2.8000e-004	1.1600e-003	1.4400e-003	0.0000	5.2086	5.2086	1.5800e-003	0.0000	5.2480
Maximum	3.0900e-003	0.0375	0.0191	6.0000e-005	1.9900e-003	1.2600e-003	3.2600e-003	2.8000e-004	1.1600e-003	1.4400e-003	0.0000	5.2086	5.2086	1.5800e-003	0.0000	5.2480

**Mitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	2.6900e-003	0.0345	0.0251	6.0000e-005	1.1200e-003	1.0200e-003	2.1400e-003	1.8000e-004	9.4000e-004	1.1200e-003	0.0000	5.2086	5.2086	1.5800e-003	0.0000	5.2480
Maximum	2.6900e-003	0.0345	0.0251	6.0000e-005	1.1200e-003	1.0200e-003	2.1400e-003	1.8000e-004	9.4000e-004	1.1200e-003	0.0000	5.2086	5.2086	1.5800e-003	0.0000	5.2480

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	12.94	7.98	-31.47	0.00	43.72	19.05	34.36	35.71	18.97	22.22	0.00	0.00	0.00	0.00	0.00	0.00

## Parrot-Phelan - Butte County, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	9-1-2020	9-30-2020	0.0387	0.0355
		Highest	0.0387	0.0355

## 2.2 Overall Operational

### Unmitigated Operational

[illegible]

## Parrot-Phelan - Butte County, Annual

**2.2 Overall Operational****Mitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.2500e-003	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>	<b>3.2500e-003</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
<b>Percent Reduction</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

**3.0 Construction Detail****Construction Phase**

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	9/1/2020	9/8/2020	5	6	

**Acres of Grading (Site Preparation Phase): 3**



## Parrot-Phelan - Butte County, Annual

**Acres of Grading (Grading Phase): 0****Acres of Paving: 0.75****Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)****OffRoad Equipment**

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Excavators	1	8.00	187	0.41
Site Preparation	Dumpers/Tenders	4	8.00	97	0.37

**Trips and VMT**

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	13.00	0.00	60.00	12.54	10.52	1.75	LD_Mix	HDT_Mix	HHDT

**3.1 Mitigation Measures Construction**

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

## Parrot-Phelan - Butte County, Annual

**3.2 Site Preparation - 2020****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.5900e-003	0.0000	1.5900e-003	1.7000e-004	0.0000	1.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7800e-003	0.0335	0.0168	5.0000e-005		1.2500e-003	1.2500e-003		1.1500e-003	1.1500e-003	0.0000	4.3044	4.3044	1.3900e-003	0.0000	4.3392
<b>Total</b>	<b>2.7800e-003</b>	<b>0.0335</b>	<b>0.0168</b>	<b>5.0000e-005</b>	<b>1.5900e-003</b>	<b>1.2500e-003</b>	<b>2.8400e-003</b>	<b>1.7000e-004</b>	<b>1.1500e-003</b>	<b>1.3200e-003</b>	<b>0.0000</b>	<b>4.3044</b>	<b>4.3044</b>	<b>1.3900e-003</b>	<b>0.0000</b>	<b>4.3392</b>

**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.0000e-005	3.7600e-003	3.9000e-004	1.0000e-005	4.0000e-005	1.0000e-005	5.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.5781	0.5781	1.7000e-004	0.0000	0.5822
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	2.0000e-004	1.8900e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3262	0.3262	2.0000e-005	0.0000	0.3266
<b>Total</b>	<b>3.2000e-004</b>	<b>3.9600e-003</b>	<b>2.2800e-003</b>	<b>1.0000e-005</b>	<b>4.0000e-004</b>	<b>1.0000e-005</b>	<b>4.1000e-004</b>	<b>1.0000e-004</b>	<b>1.0000e-005</b>	<b>1.2000e-004</b>	<b>0.0000</b>	<b>0.9043</b>	<b>0.9043</b>	<b>1.9000e-004</b>	<b>0.0000</b>	<b>0.9088</b>

## Parrot-Phelan - Butte County, Annual

**3.2 Site Preparation - 2020****Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.2000e-004	0.0000	7.2000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3800e-003	0.0305	0.0228	5.0000e-005		1.0100e-003	1.0100e-003		9.3000e-004	9.3000e-004	0.0000	4.3044	4.3044	1.3900e-003	0.0000	4.3392
<b>Total</b>	<b>2.3800e-003</b>	<b>0.0305</b>	<b>0.0228</b>	<b>5.0000e-005</b>	<b>7.2000e-004</b>	<b>1.0100e-003</b>	<b>1.7300e-003</b>	<b>8.0000e-005</b>	<b>9.3000e-004</b>	<b>1.0100e-003</b>	<b>0.0000</b>	<b>4.3044</b>	<b>4.3044</b>	<b>1.3900e-003</b>	<b>0.0000</b>	<b>4.3392</b>

**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	9.0000e-005	3.7600e-003	3.9000e-004	1.0000e-005	4.0000e-005	1.0000e-005	5.0000e-005	1.0000e-005	1.0000e-005	2.0000e-005	0.0000	0.5781	0.5781	1.7000e-004	0.0000	0.5822
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	2.0000e-004	1.8900e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3262	0.3262	2.0000e-005	0.0000	0.3266
<b>Total</b>	<b>3.2000e-004</b>	<b>3.9600e-003</b>	<b>2.2800e-003</b>	<b>1.0000e-005</b>	<b>4.0000e-004</b>	<b>1.0000e-005</b>	<b>4.1000e-004</b>	<b>1.0000e-004</b>	<b>1.0000e-005</b>	<b>1.2000e-004</b>	<b>0.0000</b>	<b>0.9043</b>	<b>0.9043</b>	<b>1.9000e-004</b>	<b>0.0000</b>	<b>0.9088</b>

**4.0 Operational Detail - Mobile**

## Parrot-Phelan - Butte County, Annual

**4.1 Mitigation Measures Mobile**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

**4.2 Trip Summary Information**

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

**4.3 Trip Type Information**

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	10.52	10.52	10.52	0.00	0.00	0.00	0	0	0

**4.4 Fleet Mix**

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.514547	0.034230	0.180067	0.120126	0.034848	0.006594	0.018358	0.079646	0.001635	0.001462	0.005861	0.001268	0.001358

## Parrot-Phelan - Butte County, Annual

## 5.0 Energy Detail

Historical Energy Use: N

## 5.1 Mitigation Measures Energy

[illegible]

## Parrot-Phelan - Butte County, Annual

## 5.2 Energy by Land Use - NaturalGas

**Unmitigated**

[illegible]

**Mitigated**

[illegible]

## Parrot-Phelan - Butte County, Annual

**5.3 Energy by Land Use - Electricity****Unmitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

**Mitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

**6.0 Area Detail****6.1 Mitigation Measures Area**

## Parrot-Phelan - Butte County, Annual

[illegible]

## 6.2 Area by SubCategory

### Unmitigated

[illegible]



## Parrot-Phelan - Butte County, Annual

**6.2 Area by SubCategory****Mitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.1400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.1100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>	<b>3.2500e-003</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

**7.0 Water Detail****7.1 Mitigation Measures Water**

## Parrot-Phelan - Butte County, Annual

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

## 7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

## Parrot-Phelan - Butte County, Annual

**7.2 Water by Land Use****Mitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

**8.0 Waste Detail****8.1 Mitigation Measures Waste****Category/Year**

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

## Parrot-Phelan - Butte County, Annual

**8.2 Waste by Land Use****Unmitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

**Mitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

**9.0 Operational Offroad**

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
----------------	--------	-----------	-----------	-------------	-------------	-----------

## Parrot-Phelan - Butte County, Annual

**10.0 Stationary Equipment**

---

**Fire Pumps and Emergency Generators**

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
----------------	--------	-----------	------------	-------------	-------------	-----------

**Boilers**

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
----------------	--------	----------------	-----------------	---------------	-----------

**User Defined Equipment**

Equipment Type	Number
----------------	--------

**11.0 Vegetation**

---

Parrot-Phelan - Butte County, Summer

**Parrot-Phelan**  
**Butte County, Summer**

## 1.0 Project Characteristics

---

### 1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	0.00	Acre	0.75	32,670.00	0

### 1.2 Other Project Characteristics

<b>Urbanization</b>	Rural	<b>Wind Speed (m/s)</b>	2.2	<b>Precipitation Freq (Days)</b>	71
<b>Climate Zone</b>	3			<b>Operational Year</b>	2021
<b>Utility Company</b>	Pacific Gas & Electric Company				
<b>CO2 Intensity (lb/MWhr)</b>	641.35	<b>CH4 Intensity (lb/MWhr)</b>	0.029	<b>N2O Intensity (lb/MWhr)</b>	0.006

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - Project activities commence Sept 2020 and gravel removal continues each year after

Land Use - Disturbed area approximately 0.75 acres.

Construction Phase - Gravel removal takes approximately 2-3 days as would erosion repair

Off-road Equipment - Equipment used excavator and dump haul truck

Trips and VMT - Estimate number of haul trips based on past removals. Haul length limited to Knife River yard

Energy Use -

Water And Wastewater - No operational component to project

Construction Off-road Equipment Mitigation - Equipment utilizing new engine tier

## Parrot-Phelan - Butte County, Summer

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstEquipMitigation	Tier	No Change	Tier 4 Interim
tblConstructionPhase	NumDays	1.00	6.00
tblConstructionPhase	PhaseEndDate	9/15/2020	9/8/2020
tblConstructionPhase	PhaseStartDate	9/15/2020	9/1/2020
tblLandUse	LandUseSquareFeet	0.00	32,670.00
tblLandUse	LotAcreage	0.00	0.75
tblOffRoadEquipment	HorsePower	158.00	187.00
tblOffRoadEquipment	HorsePower	16.00	97.00
tblOffRoadEquipment	LoadFactor	0.38	0.41
tblOffRoadEquipment	LoadFactor	0.38	0.37
tblOffRoadEquipment	OffRoadEquipmentType	Graders	Excavators
tblOffRoadEquipment	OffRoadEquipmentType	Tractors/Loaders/Backhoes	Dumpers/Tenders
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	1.75
tblTripsAndVMT	HaulingTripNumber	0.00	60.00
tblTripsAndVMT	WorkerTripNumber	18.00	13.00

## 2.0 Emissions Summary

---

## Parrot-Phelan - Butte County, Summer

**2.1 Overall Construction (Maximum Daily Emission)****Unmitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	1.0404	12.4982	6.4611	0.0198	0.6698	0.4211	1.0909	0.0944	0.3875	0.4819	0.0000	1,935.6207	1,935.6207	0.5762	0.0000	1,950.0258
Maximum	1.0404	12.4982	6.4611	0.0198	0.6698	0.4211	1.0909	0.0944	0.3875	0.4819	0.0000	1,935.6207	1,935.6207	0.5762	0.0000	1,950.0258

**Mitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	0.9088	11.5011	8.4654	0.0198	0.3781	0.3398	0.7179	0.0629	0.3128	0.3757	0.0000	1,935.6207	1,935.6207	0.5762	0.0000	1,950.0258
Maximum	0.9088	11.5011	8.4654	0.0198	0.3781	0.3398	0.7179	0.0629	0.3128	0.3757	0.0000	1,935.6207	1,935.6207	0.5762	0.0000	1,950.0258

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	12.65	7.98	-31.02	0.00	43.54	19.32	34.19	33.36	19.28	22.04	0.00	0.00	0.00	0.00	0.00	0.00



## Parrot-Phelan - Butte County, Summer

**2.2 Overall Operational****Unmitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0178	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
<b>Total</b>	<b>0.0178</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

**Mitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0178	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
<b>Total</b>	<b>0.0178</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

## Parrot-Phelan - Butte County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**3.0 Construction Detail****Construction Phase**

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	9/1/2020	9/8/2020	5	6	

**Acres of Grading (Site Preparation Phase): 3****Acres of Grading (Grading Phase): 0****Acres of Paving: 0.75****Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)****OffRoad Equipment**

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Excavators	1	8.00	187	0.41
Site Preparation	Dumpers/Tenders	4	8.00	97	0.37

**Trips and VMT**

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	13.00	0.00	60.00	12.54	10.52	1.75	LD_Mix	HDT_Mix	HHDT

## Parrot-Phelan - Butte County, Summer

**3.1 Mitigation Measures Construction**

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

**3.2 Site Preparation - 2020****Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.5303	0.0000	0.5303	0.0573	0.0000	0.0573			0.0000			0.0000
Off-Road	0.9252	11.1722	5.6057	0.0163		0.4183	0.4183		0.3849	0.3849		1,581.580 0	1,581.580 0	0.5115		1,594.367 9
<b>Total</b>	<b>0.9252</b>	<b>11.1722</b>	<b>5.6057</b>	<b>0.0163</b>	<b>0.5303</b>	<b>0.4183</b>	<b>0.9486</b>	<b>0.0573</b>	<b>0.3849</b>	<b>0.4421</b>		<b>1,581.580 0</b>	<b>1,581.580 0</b>	<b>0.5115</b>		<b>1,594.367 9</b>

## Parrot-Phelan - Butte County, Summer

**3.2 Site Preparation - 2020****Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0274	1.2640	0.1050	2.1100e-003	0.0155	1.8300e-003	0.0174	4.2700e-003	1.7500e-003	6.0300e-003		220.9526	220.9526	0.0581		222.4055
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0879	0.0621	0.7505	1.3400e-003	0.1240	9.8000e-004	0.1250	0.0329	9.1000e-004	0.0338		133.0881	133.0881	6.5700e-003		133.2524
<b>Total</b>	<b>0.1153</b>	<b>1.3260</b>	<b>0.8555</b>	<b>3.4500e-003</b>	<b>0.1395</b>	<b>2.8100e-003</b>	<b>0.1423</b>	<b>0.0372</b>	<b>2.6600e-003</b>	<b>0.0398</b>		<b>354.0406</b>	<b>354.0406</b>	<b>0.0647</b>		<b>355.6579</b>

**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2386	0.0000	0.2386	0.0258	0.0000	0.0258			0.0000			0.0000
Off-Road	0.7935	10.1751	7.6100	0.0163		0.3370	0.3370		0.3101	0.3101	0.0000	1,581.5800	1,581.5800	0.5115		1,594.3679
<b>Total</b>	<b>0.7935</b>	<b>10.1751</b>	<b>7.6100</b>	<b>0.0163</b>	<b>0.2386</b>	<b>0.3370</b>	<b>0.5756</b>	<b>0.0258</b>	<b>0.3101</b>	<b>0.3359</b>	<b>0.0000</b>	<b>1,581.5800</b>	<b>1,581.5800</b>	<b>0.5115</b>		<b>1,594.3679</b>

## Parrot-Phelan - Butte County, Summer

**3.2 Site Preparation - 2020****Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0274	1.2640	0.1050	2.1100e-003	0.0155	1.8300e-003	0.0174	4.2700e-003	1.7500e-003	6.0300e-003		220.9526	220.9526	0.0581		222.4055
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0879	0.0621	0.7505	1.3400e-003	0.1240	9.8000e-004	0.1250	0.0329	9.1000e-004	0.0338		133.0881	133.0881	6.5700e-003		133.2524
<b>Total</b>	<b>0.1153</b>	<b>1.3260</b>	<b>0.8555</b>	<b>3.4500e-003</b>	<b>0.1395</b>	<b>2.8100e-003</b>	<b>0.1423</b>	<b>0.0372</b>	<b>2.6600e-003</b>	<b>0.0398</b>		<b>354.0406</b>	<b>354.0406</b>	<b>0.0647</b>		<b>355.6579</b>

**4.0 Operational Detail - Mobile****4.1 Mitigation Measures Mobile**

## Parrot-Phelan - Butte County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

## 4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

## 4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Non-Asphalt Surfaces	10.52	10.52	10.52	0.00	0.00	0.00	0	0	0

## 4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.514547	0.034230	0.180067	0.120126	0.034848	0.006594	0.018358	0.079646	0.001635	0.001462	0.005861	0.001268	0.001358

## 5.0 Energy Detail

---

Historical Energy Use: N

## Parrot-Phelan - Butte County, Summer

**5.1 Mitigation Measures Energy**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

**5.2 Energy by Land Use - NaturalGas****Unmitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

## Parrot-Phelan - Butte County, Summer

**5.2 Energy by Land Use - NaturalGas****Mitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

**6.0 Area Detail****6.1 Mitigation Measures Area**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0178	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0178	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000



## Parrot-Phelan - Butte County, Summer

**6.2 Area by SubCategory****Unmitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	6.2200e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0116					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
<b>Total</b>	<b>0.0178</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>

**Mitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	6.2200e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0116					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
<b>Total</b>	<b>0.0178</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>		<b>0.0000</b>

**7.0 Water Detail**

## Parrot-Phelan - Butte County, Summer

---

**7.1 Mitigation Measures Water****8.0 Waste Detail**

---

**8.1 Mitigation Measures Waste****9.0 Operational Offroad**

---

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
----------------	--------	-----------	-----------	-------------	-------------	-----------

**10.0 Stationary Equipment**

---

**Fire Pumps and Emergency Generators**

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
----------------	--------	-----------	------------	-------------	-------------	-----------

**Boilers**

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
----------------	--------	----------------	-----------------	---------------	-----------

**User Defined Equipment**

Equipment Type	Number
----------------	--------

**11.0 Vegetation**

---



**Appendix C**  
**Biological Resources Assessment**

---



# **Biological Resources Assessment**

## **Parrott-Phelan Diversion Dam Restoration Chico, California**

June 2020



*Prepared for:*

M&T Ranch  
3964 Chico River Road  
Chico, CA 95928

*Prepared by:*



111 Mission Ranch Blvd., Suite 100, Chico, CA 95926, Phone: 530.893.1600, Fax: 530.893.2113  
info@NorthStarEng.com | www.NorthStarEng.com



# **Biological Resources Assessment**

## **Parrott-Phelan Restoration Butte County, CA**

June 2020

*Prepared for:*

M&T Ranch  
3964 Chico River Road  
Chico, CA 95928

*Prepared by:*



111 Mission Ranch Blvd., Suite 100, Chico, CA 95926, Phone: 530.893.1600, Fax: 530.893.2113  
info@NorthStarEng.com | www.NorthStarEng.com





# Table of Contents

<b>1.</b>	<b>EXECUTIVE SUMMARY .....</b>	<b>4</b>
<b>2.</b>	<b>INTRODUCTION .....</b>	<b>5</b>
2.1	Project Description .....	5
<b>3.</b>	<b>METHODS .....</b>	<b>8</b>
3.1	Biological Resources .....	9
3.2	Field Surveys and Personnel .....	9
3.3	Waters of the United States .....	10
3.4	Previous Surveys .....	10
<b>4.</b>	<b>RESULTS .....</b>	<b>10</b>
4.1	Existing Conditions .....	10
4.2	Habitat Types .....	11
4.3	Sensitive Natural Communities .....	13
4.4	Critical Habitat .....	13
4.5	Special-Status Species and Sensitive Natural Communities .....	13
4.5.1	Plants .....	23
4.5.2	Invertebrates .....	23
4.5.3	Fish .....	24
4.5.4	Reptiles and Amphibians .....	27
4.5.5	Birds .....	29
4.5.6	Mammals .....	30
4.6	Waters of the United States .....	32
4.7	Previous Surveys .....	32
<b>5.</b>	<b>REGULATORY FRAMEWORK .....</b>	<b>32</b>
5.1	Federal Regulations .....	32
5.2	State Regulations .....	34
<b>6.</b>	<b>CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>36</b>
6.1	Worker Awareness Training .....	36
6.2	Valley Elderberry Longhorn Beetle .....	36
6.3	Anadromous Fish including Spring Run Chinook salmon and Central Valley Steelhead .....	36
6.4	Foothill Yellow-legged Frog .....	36
6.5	Northwestern Pond Turtle .....	36
6.6	Birds including bald eagle, osprey and yellow warbler .....	37
6.7	Bats including hoary bay, silver-haired bat and western red bat .....	37
6.8	North American porcupine .....	38
6.9	Waters of the United States .....	38
<b>7.</b>	<b>REFERENCES .....</b>	<b>39</b>

# List of Tables and Figures

## Tables

Table 1. Special-status Species and Sensitive Natural Communities Identified by USFWS, CNDDDB, and CNPS as Potentially Occurring in the Biological Survey Area. .... 14

## Figures

Figure 1: Location Map ..... 6

Figure 2: CNDDDB Occurrences within 5-miles of the BSA..... 14

Figure 3: Habitat Map

## Appendices

Appendix A. USFWS Species List

Appendix B. CNDDDB Species List

Appendix C. CNPS Species List

Appendix D. Species Observed

## List of Abbreviated Terms

BSA	Biological Survey Area
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFGF	California Fish and Game Code
CFS	Cubic Feet per Second
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationships
ESA	Federal Endangered Species Act
IPAC	Information for Planning and Consultation
MBTA	Migratory Bird Treaty Act
msl	Mean Sea Level
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRPW	Non-Relatively Permanent Waters
RPW	Relatively Permanent Waters
RWQCB	Regional Water Quality Control Board
SNC	Sensitive Natural Community
SWRCB	State Water Resources Control Board
TNW	Traditional Navigable Waters
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WOTUS	Waters of the United States

## 1. EXECUTIVE SUMMARY

NorthStar conducted biological surveys on the approximately 16-acre Biological Survey Area (BSA) for the proposed Parrott-Phelan Diversion Dam Restoration located southeast of the City of Chico in Butte County, California. The BSA is primarily comprised of Butte Creek and the surrounding terrestrial habitats. The BSA is bordered by Honey Run Road to the north, and in addition to Butte Creek, the BSA encompasses a diversion dam, a fyke trap, a fyke outfall pipe, an overflow weir, and an area along the creek that accumulates gravel each year. Habitat within the BSA is primarily composed of valley foothill riparian and riverine, but also includes a small upland area of annual grassland. Biological surveys were conducted on March 7, 2018, March 29, 2018, October 1, 2018, August 12, 2019, and September 5, 2019 by NorthStar biologists Matt Rogers, Carol Wallen, Jake Sivertson, Alyson Wallace, Andrew Huneycutt, and Billy Abbott to determine the presence of sensitive biological resources within the BSA and if present, to determine if these resources would be impacted by the proposed project.

No special-status plants were observed or are known to occur within the BSA.

The BSA contains one blue elderberry shrub (*Sambucus nigra* ssp. *cerulea*), which provides suitable habitat for one federally listed threatened invertebrate, the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). Though this shrub is located within the BSA it is located well outside of the construction area.

The BSA provides suitable habitat for three special status fish species. The federally-listed threatened Central Valley steelhead (*Oncorhynchus mykiss*) and Central Valley spring-run chinook salmon (*Oncorhynchus tshawytscha*), which is also state-listed threatened, and the Central Valley fall/late fall-run chinook salmon (*Oncorhynchus tshawytscha*), a federal candidate species, are all known to occur within the BSA.

The BSA provides suitable habitat for one special-status amphibian species, the foothill yellow-legged frog (*Rana boylei*) and one special-status reptile species, northwestern pond turtle (*Actinemys marmorata*). Additionally, the foothill yellow-legged frog is listed as threatened under the California Endangered Species Act (CESA).

With respect to bird species, the BSA provides potentially suitable foraging habitat for the bald eagle (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), and the yellow warbler (*Setophaga petechia*). Additionally, the BSA provides suitable foraging and nesting habitat for variety of migratory birds protected by the Migratory Bird Treaty Act (MBTA) within the riparian habitat and small grassland and barren areas. No large stick nests were observed during site surveys.

The BSA provides suitable habitat for four special-status mammal species: hoary bat (*Lasiurus cinereus*), northern porcupine (*Erethizon dorsatum*), silver-haired bat (*Lasionycteris noctivagans*) and western red bat (*Lasiurus blossevillii*).

A section of Butte Creek, a U.S. Army Corps of Engineers (USACE) jurisdictional aquatic resource, falls within the BSA. The creek, a tributary to the Sacramento River, is the only jurisdictional aquatic feature in the BSA.

## 2. INTRODUCTION

NorthStar has conducted biological surveys within the Parrott-Phelan Restoration BSA near Chico, California. The BSA is located southeast of the City of Chico in Butte County, California in Sections 2, 3, and 4, Township 21N Range 2E, of the Chico U.S. Geological Survey (USGS) 7.5-minute quadrangle (**Figure 1-Location Map**). Several surveys were conducted between March, 2018 and September, 2019 by NorthStar biologists to determine the presence of sensitive natural resources and to determine if these resources would be impacted by the proposed project. The BSA includes an approximate 250-foot buffer surrounding the immediate project area.

The BSA is comprised of Butte Creek and the surrounding riparian, grassland, and barren habitats. It encompasses the Parrott-Phelan diversion dam, a fyke fish trap, fyke outfall pipe, fish ladder, an overflow weir and two managed gravel bars.

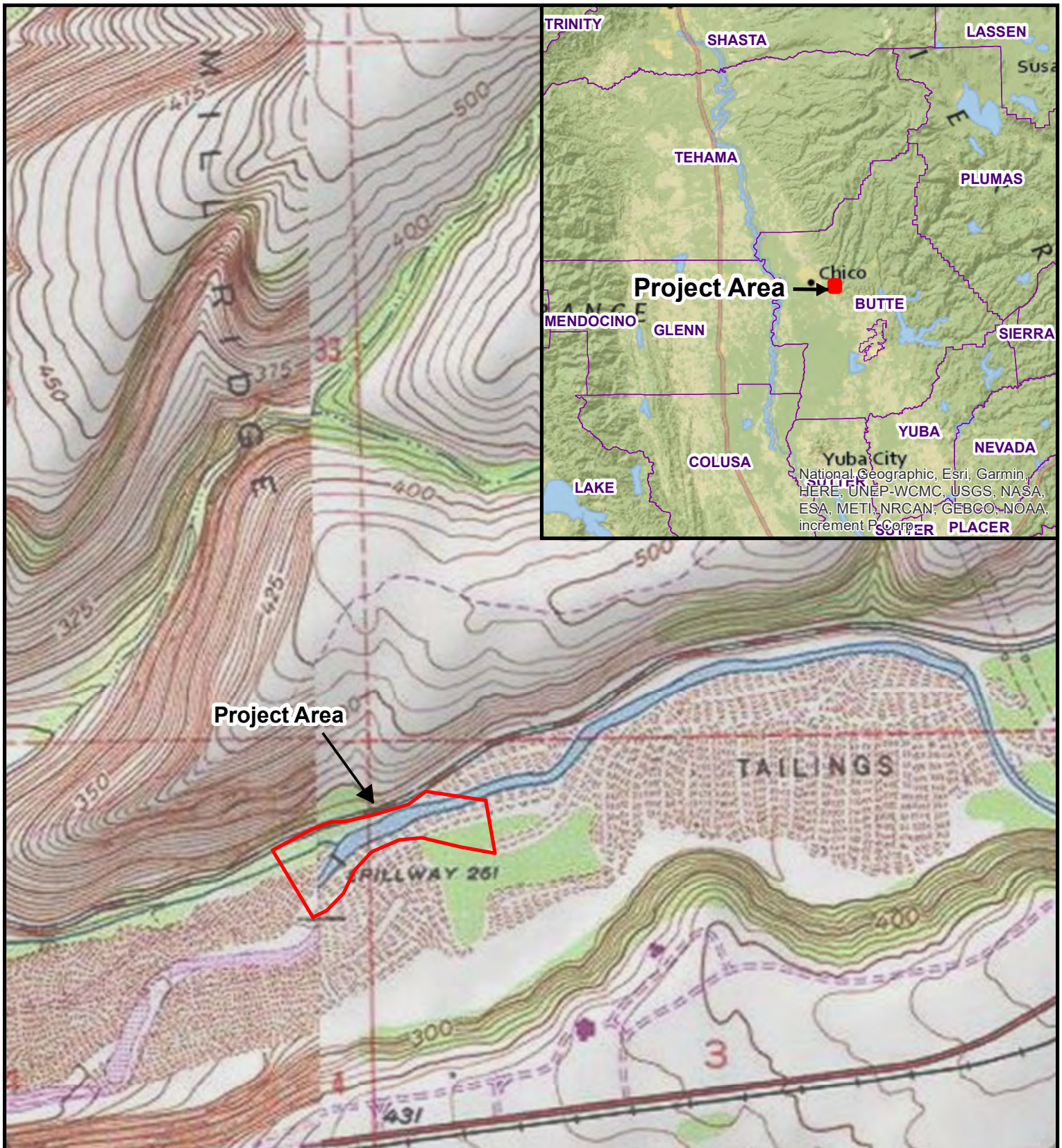
### 2.1 Project Description

#### 2.1.1 Background

In late 1996 and early 1997 extreme precipitation events led to extensive flooding in Butte Creek Canyon. Unprecedented flows of over 35,000 cubic feet per second caused substantial property damage within the canyon. Due to the severity and scale of the flood flows, Butte Creek experienced dramatic changes in its bed morphology and course, especially in the area within and surrounding the proposed project area. During the flood events, Butte Creek shifted alignment at the Parrott-Phelan Diversion, completely dewatering the diversion and the surrounding area. The diversion and fish screening project that had been completed in 1995 were in jeopardy. A cooperative project between a variety of agencies resulted in the reestablishment of the original channel and a flood bypass to handle excess flood flows to protect the diversion from channel realignment in the future. The flood bypass channel contains rock slope protection along Butte Creek just past the entrance to the overflow. Shotcrete and rock slope protection was utilized to stabilize the entrance to the overflow channel to prevent additional erosion. The overflow has a weir incorporated into it to keep flows below flood level in the main stem of Butte Creek. The project was completed in the late fall of 1997. Subsequently, a point bar was established on the inside of the sharp bend where the realignment of the creek occurred; here, gravel is deposited during high flow events. The gravel has been removed and relocated for a number of years to prevent the continued deposition that could ultimately scour the opposing bank or divert the main course of Butte Creek into the overflow channel rendering the diversion, fish screens, fish ladder, and the CDFW fish monitoring program inoperable.

There has been continued erosion along the southern bank downstream of the existing weir. An examination of aerial photography from 2005 to present shows a southerly shift in the bank of approximately 30 feet south. This not only threatens the physical integrity of the existing infrastructure, but it could potentially make fish passage more difficult at the weir by making the fish ladder inaccessible. In the winter of 2016/2017, there were extreme storm events that cause very large flow spikes and sustained high flows. According to flow gauge data from Butte Creek, collected by the California Department of Water Resources, flows for the 2016/2017 winter peaked at 17,700 cubic feet per second (cfs) and other peak flows topping 15,000 cfs and 11,500 cfs within a two-and-a-half-month period. These high peak flows coupled with the above average sustained flows caused increased erosion along the banks of the creek, and





## Legend

Project

0 500 1,000 2,000  
Feet

1 inch = 1,000 ft (printed at 8.5 x 11)

Imagery Source:  
USGS Topo  
Inset Imagery:  
National Geographic



Within Sections 2,3,4,  
Township 21N, Range 02E,  
Butte County, CA  
CHICO & HAMLIN CANYON  
USGS 7.5' Quad

Map Date:  
June 26, 2020

Drawn By:  
BSA

NSE Project #  
18-019

## Figure 1: Location Map

Parrott-Phelan Restoration  
- Butte County, CA -



**NORTHSTAR**  
... Designing Solutions

111 MISSION RANCH BLVD., SUITE 100 CHICO, CA 95926  
PHONE: (530) 893-1600 - [www.NorthStarEng.com](http://www.NorthStarEng.com) - © NorthStar

especially the southern bank downstream of the weir. Significant lengths of bank were lost to undercut erosion on the southern bank immediately downstream of the weir. The southern bank was also eroded along the southern side of the weir itself. This erosion was precipitated by accumulated gravel downstream of the existing weir that had been routinely placed as part of previous maintenance operations. The gravel had been placed above the ordinary high-water mark and was not being mobilized during high flow events as was anticipated. In addition to this erosion gravel threatened to cut off access to the fish ladder and diminished attractant flows throughout it. Additionally, this accumulated gravel downstream of the weir has caused problems with an outfall pipe to the existing diversion that carries fish unharmed back to Butte Creek.

### *2.1.2 Project Description*

The proposed project involves a variety of routine maintenance activities at or near the Parrott-Phelan Diversion including gravel removal, erosion repair along the bank, and erosion repair at the existing weir.

#### *Gravel Removal*

The gravel removal will be conducted at the extraction area located upstream of the existing water diversion. As has occurred in the past removals, an excavator would be utilized to remove the accumulated gravel and place it in dump haul trucks and removed from the project site. In the past the gravel had been placed downstream of the existing weir above the ordinary high-water mark to be reintroduced into the creek during high flow events. It has been proven that this was not working, and the gravel would not mobilize as predicted during high flow events. As such the gravel accumulated below the weir and caused excessive erosion to the southern bank of Butte Creek during the winter of 2016/2017. The gravel will no longer be placed below the existing weir. Instead, it will be hauled off-site to the Knife River Construction yard located approximately 1.75 miles from the project area at 1764 Skyway Road, Chico, CA 95928. A berm will be left intact between the active channel of Butte Creek and the gravel extraction area to minimize potential siltation and turbidity. Additionally, silt fencing, straw wattle, and other siltation barriers will be utilized to minimize potential siltation. Accumulated gravel around the fyke outfall pipe will also be removed so as to ensure that it remains unobstructed to meet the needs of the fish screening project.

The amount of accumulated gravel to be removed will vary year to year, primarily influenced by flows during the winter months. Approximately, 1,800 cubic yards of accumulated material was removed in 2018, but accumulation amounts can be as high as approximately 6,000 cubic yards. The anticipated depth of excavation will be approximately three to five feet depending on the year. Accumulated gravel will be removed between August 15 to September 7 in each year to coincide with the peak of low flows within Butte Creek, and when listed salmonids are not likely to occur within the project area. The excavator will not enter the flowing water of Butte Creek and all equipment will be steam cleared prior to beginning work. Equipment will be parked, fueled, and maintained outside of the stream zone and will access the site off Honey Run Road using an existing truck access road. No riparian vegetation will be removed, and temporary fencing will delineate access and haul routes. It is anticipated gravel removal will take two to three days to complete. Upon completion of the gravel removal any construction related best management practices including silt fencing would be removed from the extraction area.



### *Erosion Repair on Southern Bank*

Repair of the eroded on the southern bank of Butte Creek would be accomplished by the placement of fill material and rock slope protection along the bank to protect against any future erosion. Backfill material would be placed and rock slope protection facing using boulders two to four-foot diameter would be placed over geotextile fabric to repair the eroded areas. The rock slope protection would be keyed in properly to stabilize the eroded area. The density has been selected in order to stand up to sheer stresses and water velocities encountered in this portion of the creek. It is anticipated that the total rock slope protection utilized will be quarter ton with an individual rocks having an approximate diameter of 24 inches and above.

In order to repair erosion on the southern bank downstream of the existing weir, a pad composed of clean gravel pushed into the creek will be utilized to access the eroded area. A similar strategy has been utilized in another project along Butte Creek, the Aguas Frias Bridge Replacement Project, and will also be used at the Midway Bridge Replacement Project. Most of the clean gravel utilized in constructing the pad will be removed upon completion of the erosion repair. The little clean gravel that would remain in Butte Creek after removal will benefit aquatic organisms including salmonids.

Equipment utilized would include but not be limited to an excavator and haul trucks.

### *Weir Repair*

A triangular shaped hole has developed on the facing of the south side of the weir adjacent to the upper portions of wingwall of the fish ladder. The hole is approximately 30 feet long along the face of the weir and approximately 10 feet long along the wingwall of the fish ladder. It varies in depth from only a few inches to several feet where the weir meets the fish ladder. This hole is threatening to undermine the concrete apron of the weir and could cause significant and costly damage. As part of the project, the existing hole would be filled with approximately 20 cubic yards of rock to repair the erosion that has taken place. It is anticipated the rock used to fill the hole will be between 200 pound and quarter ton size, which has a diameter ranging from approximately 16 inches to 24 inches.

### *Water Diversion*

Water diversion may be necessary to allow the erosion repair and to repair the weir. During construction the weir will be raised, as it normally is during the summer months. Sandbags or large cubic yard material bags may be utilized to divert water either down the existing fish ladder or into the diversion where water would exit through the diversion pipe outfall located downstream of the existing weir. This would permit aquatic wildlife passage through the project area. An additional method that could be utilized is keeping a portion of the wetted channel open between the gravel pad and either bank edge to allow passage of aquatic wildlife while still facilitating equipment access. As previously mentioned, this method was used successfully at the Aguas Frias Bridge Replacement Project on Butte Creek downstream of the project site and is proposed for the Midway Bridge Replacement Project.

## **3. METHODS**

Prior to conducting the field surveys, existing databases, topographic maps, and aerial photos of the site were reviewed and areas of potential habitat noted. The BSA was established by setting a 250-foot buffer around the project area which includes an approximately 1,725' section of Butte

Creek, the surrounding foothill valley riparian and annual grassland habitats, the diversion dam, fyke trap, gravel bars, and weir.

### **3.1 Biological Resources**

#### **3.1.1 Soil**

Using the Natural Resources Conservation Service's (NRCS) web soil survey, NorthStar identified and mapped the soil type(s) within the BSA.

#### **3.1.2 Sensitive Natural Communities**

Using Rarefind 5 NorthStar consulted the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDDB) to identify Sensitive Natural Communities (SNCs) occurring on the Chico and eight surrounding USGS 7.5-minute quadrangles. These SNCs were then surveyed for within the BSA during the field visit.

#### **3.1.3 Critical Habitat**

NorthStar determined if United States Fish and Wildlife Service (USFWS)-designated critical habitat for special-status species occurs in the BSA by reviewing the USFWS Information for Planning and Consultation (IPAC) database for the project site.

#### **3.1.4 Special-Status Species**

Lists of special-status species that potentially occur in the vicinity of the BSA were obtained from the USFWS IPAC (USFWS, (**Appendix A**), the CDFW's CNDDDB, (**Appendix B**), and the California Native Plant Society's (CNPS) Online Rare and Endangered Plant Inventory v8-03 (**Appendix C**).

### **3.2 Field Surveys and Personnel**

NorthStar biologists conducted five biological surveys within the BSA. General biological resources and habitat assessments were conducted to determine the presence of special-status species and habitats within the BSA, and to determine if these resources would be impacted by the project. The surveys included conducting meandering transects throughout the BSA, with a special focus on habitat types frequently associated with special-status species. Species encountered during biological surveys can be found in (**Appendix D**).

Surveys were conducted on the following dates:

- March 7, 2018 by NorthStar biologist Matt Rogers and Andrew Huneycutt.
- March 29, 2018 by NorthStar biologists Carol Wallen and Matt Rogers.
- October 1, 2018 by NorthStar biologists Matt Rogers and Billy Abbott.
- August 12, 2019 by NorthStar biologists Matt Rogers and Alyson Johnson.
- September 5, 2019 by NorthStar biologist Jake Sivertson.

Following the field surveys, the "potential for occurrence" was determined based on the quality and types of habitats observed on the site. For plants, the potential for occurrence on site is considered during the appropriate survey/flowering period. For birds and bats, the potential for occurrence is considered during the appropriate timeframes when these species breed, forage, roost, over-winter, or stop-over in the BSA during migration. Any bird or bat species could fly

over the BSA, but this is not considered a potential for occurrence. Categories for occurrence potential include:

- **None:** The species or natural community is known not to occur, and has no potential to occur in the BSA based on sufficient surveys, the lack of suitable habitat (including soil, vegetation, connectivity, etc.), and/or the BSA is well outside of the known distribution of the species.
- **Low:** Potential habitat in the BSA is sub-marginal and the species is not known to occur in the vicinity. Protocol-level surveys are not recommended.
- **Moderate:** Suitable habitat is present in the BSA and the species is known to occur in the vicinity of the BSA.
- **High:** Habitat in the BSA is highly suitable for the species and there are reliable records of occurrence close to the BSA, but the species was not observed.
- **Known:** The species or natural community was identified in the BSA, or a recent reliable record exists for the BSA.

### 3.3 Waters of the United States

Within the project area the only waters of the United States (WOTUS) is Butte Creek, a perennial stream. The hydrology of Butte Creek is affected by runoff from rain events. In the winter and spring, when rains events are most common and heaviest Butte Creek is subject to spikes in flow and high sustained flows. During the summer and fall months flows are typically smaller and slower with much less variation. Flows during the summer and fall may be supplemented with additional water from the West Branch of the Feather River to keep water temperatures at a habitable temperature (i.e. cool enough) for salmon holding in the upper portions of Butte Creek above the BSA.

### 3.4 Previous Surveys

The California Department of Fish and Wildlife (CDFW) conducts long-term juvenile fish surveys, targeting Chinook salmon within the BSA. Yearly from October to June CDFW utilizes two fish traps, a fyke trap at the diversion dam and rotary screw trap at the fish ladder, to collect data on juvenile salmon escapement and sample fish species within the creek. CDFW maintains an up to date database of the data they collect from the traps. No other surveys prior to those conducted by NorthStar are known to have occurred.

## 4. RESULTS

### 4.1 Existing Conditions

The project site is located approximately 1.5 miles southeast of the City of Chico, on the southern side of Honey Run Road. The BSA is approximately 16 in size acres and is composed of Butte Creek, a perennial stream and tributary to the Sacramento River, and the surrounding foothill valley riparian, disturbed annual grassland and barren habitats. The overstory is primarily comprised of Fremont cottonwood (*Populus fremontii*) and California sycamore (*Platanus racemosa*) with a subcanopy largely composed of white alder (*Alnus rhombifolia*) and boxelder (*Acer negundo*). The shrub layer is largely made up of wild grape (*Vitis californica*), Himalayan

blackberry (*Rubus armeniacus*), sandbar willow (*Salix exigua*), arroyo willow (*Salix lasiolepis*), poison oak (*Toxicodendron diversilobum*), and a blue elderberry shrub. Herbaceous vegetation is predominantly non-native grasses and forbs. The BSA is within the 2018 Camp Fire burn scar and vegetation within the BSA has been affected by the fire.

The BSA includes several manmade appurtenances associated with water diversion structures including the Parrott-Phelan diversion dam, fish ladder, fish screens, a fyke trap, fyke outfall pipe, an overflow weir. The project is bound by Honey Run Road to the north, and is surrounded by foothill valley riparian, riverine, and annual grassland habitats to the east, south and west. A low density of residential homes is present both up and downstream of the BSA. There are two unmaintained gravel and dirt roads within the project site. One leads from Honey Run Road to the diversion dam / downstream gravel bar and is approximately 510' long. The second leads from Honey Run Road to the upstream gravel bar and is approximately 430' long.

## 4.2 Soils

According to Natural Resources Conservation Service's (NRCS) the soils within the project area consist of one mapped soil unit, Xerorthents, Tailings, 0-50% slopes. General characteristics associated with this soil type are described below.

- **Xerorthents, Tailings, 0-50% slopes:** This soil type occurs within an elevational range of 90-1,340 feet above mean sea level (msl). It is comprised of gravelly and sandy loam, derived from dredged spoil piles from gravelly alluvium derived from igneous, metamorphic and sedimentary rock, and as a result is well drained.

Topography on the site is gently sloping from east to west with an elevation of approximately 270 feet above msl. Surface runoff flows from either side of the canyon into Butte Creek, which flows from east to west, into the Central Valley where it eventually meets with the Sacramento River.

## 4.3 Habitat Types

California habitat types are described in the California Wildlife Habitat Relationships (CWHR) system based on classifications created by Mayer and Laudenslayer (1988). The CWHR system was designed to aid in the mapping of habitats utilized by California's commonly occurring birds, mammals, reptiles, and amphibians.

The BSA is composed primarily of riverine and valley foothill riparian habitats. Few small areas of annual grassland and patches of barren habitats can be found interspersed within project site as well.

### 4.3.1 Annual Grassland

Annual grassland habitats can be found throughout California and are found on flat plains to gently rolling foothills and often occur in between or adjacent to other wooded habitat types. Annual grasslands are described as open grasslands composed primarily of annual plant species and often consist of a variety of introduced invasive species. Species composition is strongly influenced by abiotic factors and compositional changes fluctuate seasonally due to the phenology of plants.

found within an area. Species commonly found within annual grasslands include wild oats (*Avena fatua*), ripgut brome (*Bromis diandrus*), red brome (*Bromus madritensis*), soft chess (*Bromus hordeaceus*), wild barely (*Hordeum* spp.), foxtail fescue (*Vulpia myuros*), filaree (*Erodium* spp.), and various clovers (*Trifolium* spp.) among others.

A number of wildlife species use annual grasslands for breeding and foraging. Species encountered during surveys included western fence lizard (*Sceloporus occidentalis*), lesser goldfinch (*Spinus psaltria*), American goldfinch (*Spinus tristis*), and white-crowned sparrow (*Zonotrichia leucophrys*).

#### 4.3.2 Valley Foothill Riparian

Valley foothill riparian habitat generally is found in association with riverine systems in California. Structurally, valley foothill riparian habitats are quite diverse, containing distinct vegetation layers. Valley foothill riparian canopy within the BSA contains a mix of Fremont cottonwood (*Populus fremontii*), western sycamore (*Platanus racemosa*), Goodding's black willow (*Salix gooddingii*), and valley oak (*Quercus lobate*) with a canopy cover of 20 to 80 percent. The subcanopy includes arroyo willow (*Salix lasiolepis*), sandbar willow (*Salix exigua*), and white alder (*Alnus rhombifolia*). In addition to a subcanopy, a vine understory is present, which includes Himalayan blackberry (*Rubus armeniacus*), California grape (*Vitis californica*), poison oak (*Toxicodendron diversilobum*), and interspersed various shade tolerant grasses.

The diversity of vegetative structure within valley foothill riparian habitats provides food, water, nesting, dispersal habitat, and shelter for a number of species especially birds protected by the Migratory Bird Treaty Act. Species observed during surveys include black phoebe (*Sayornis nigricans*), belted kingfisher (*Megasceryle alcyon*), spotted towhee (*Pipilo maculatus*), oak titmouse (*Baeolophus inornatus*) and cedar waxing (*Bombycilla cedrorum*).

#### 4.3.3 Riverine

Riverine habitat is defined as a major intermittent or perennial stream and the inclusive habitats surrounding the channel edges. Butte Creek originates at roughly 4,800' in the Butte Meadows/Jonesville Basin, approximately 28 miles northeast of the BSA.

Riverine habitats provide foraging and breeding habitat as well as cover for a number of species. During surveys some of the observed species include Chinook salmon (*Oncorhynchus tshawytscha*), Sacramento pikeminnow (*Ptychocheilus grandis*) rainbow trout (*Oncorhynchus mykiss*) and common merganser (*Mergus merganser*).

#### 4.2.4 Barren

Barren habitat is characterized by a lack of vegetation. Any habitat with less than two percent total vegetation cover by herbaceous, desert, or non-wildland species and less than 10 percent cover by tree or shrub species is defined as barren. Structure and composition of the substrate is extremely variable and determined by several factors, including region, surrounding environment, disturbance levels, etc. Within the BSA the barren habitat includes the two managed gravel bars and the area of shotcrete and RSP around the weir.

Barren habitats are not completely devoid of wildlife. A number of species will use barren areas to roost, nest, and forage. Instead of the vegetative structure being an important component of the habitat, the structure of the substrate becomes critical. During surveys killdeer (*Charadrius vociferous*) and western fence lizard (*Sceloporus occidentalis*) were observed.

#### **4.4 Sensitive Natural Communities**

Sensitive natural communities (SNCs) are important ecologically as their elimination or degradation could threaten populations of dependent plant and wildlife species and significantly reduce the regional distribution and viability of the community. The loss of SNCs may eliminate or reduce important ecosystem functions including water filtration by wetlands or bank stabilization by riparian woodlands.

There are no SNCs present within the BSA.

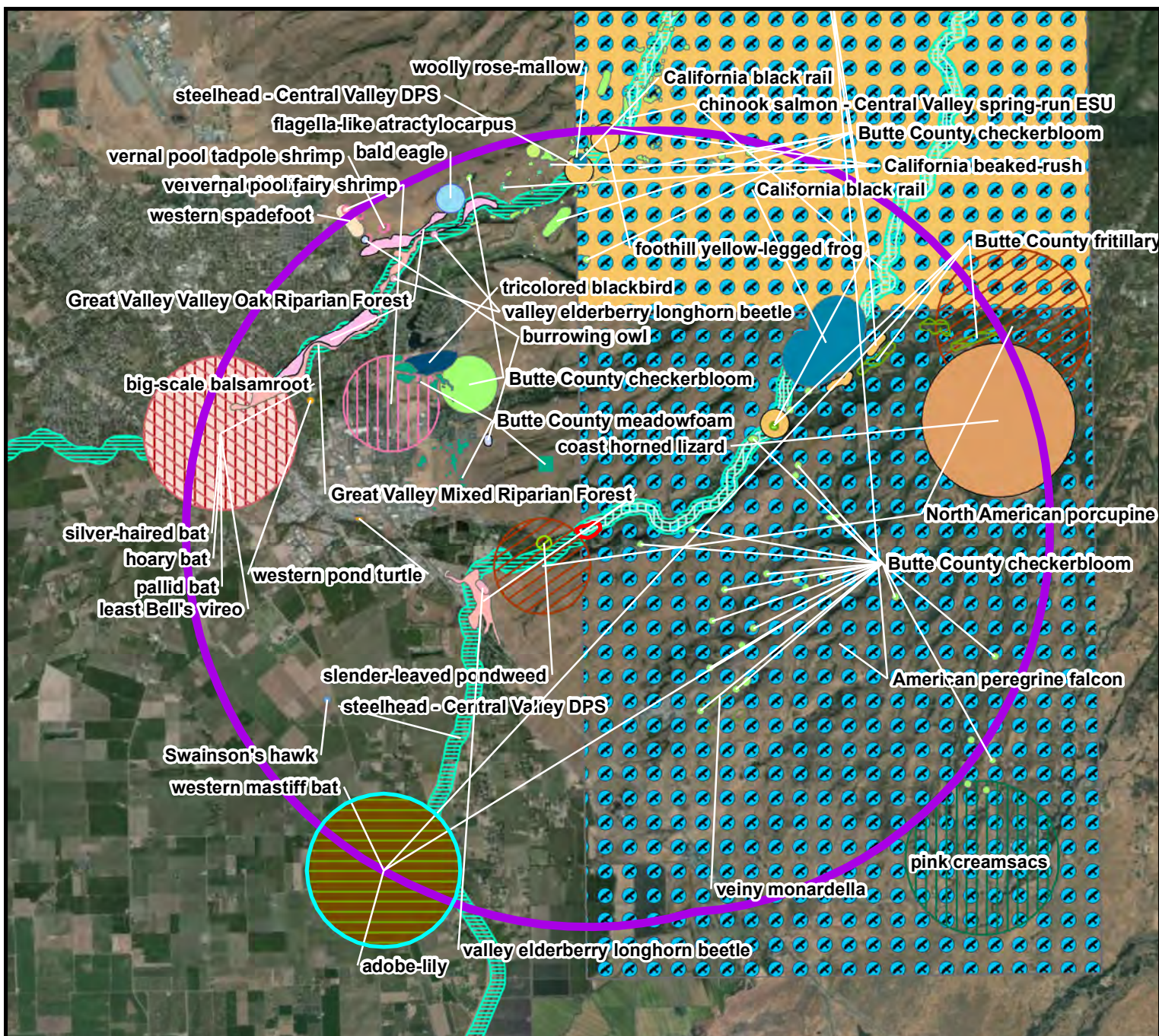
#### **4.5 Critical Habitat**

Critical habitat for two fish species is found within the BSA. USFWS has designated Butte Creek as critical habitat for both the Central Valley steelhead and Central Valley spring-run Chinook salmon.

#### **4.6 Special-Status Species and Sensitive Natural Communities**

All of the special-status species and sensitive natural communities listed by the USFWS, CDFW, and CNPS as occurring within the Chico and/or eight surrounding USGS quadrangles are presented in **Table 1** along with their assessed potential to occur within the BSA. A map of all CNDDDB special-status species and sensitive natural communities occurrences within five miles of the BSA is provided in **Figure 2**. The special-status species with at least moderate potential to occur within the BSA are valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), Central Valley spring-run Chinook salmon Evolutionary Significant Unit (ESU) (*Oncorhynchus tshawytscha*), Central Valley steelhead Distinct Population Segment (*Oncorhynchus mykiss*), foothill yellow-legged frog (*Oncorhynchus mykiss*) northwestern pond turtle (*Actinemys marmorata*), bald eagle (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), yellow warbler (*Setophaga petechia*), hoary bat (*Lasiurus cinereus*), North American porcupine (*Erethizon dorsatum*) silver-haired bat (*Lasionycteris noctivagans*) and western red bat (*Lasiurus blossevillii*). Additionally, suitable habitat for a variety of other migratory birds and raptors occurs within the BSA.





#### Legend

Project Area

5 Mile Buffer of Project Area

#### Common Name

Great Valley Mixed Riparian Forest

Great Valley Valley Oak Riparian Forest

adobe-lily

big-scale balsamroot

Butte County checkerbloom

Butte County fritillary

Butte County meadowfoam

California beaked-rush

flagella-like atractylocarpus

pink creamsacs

slender-leaved pondweed

veiny monardella

woolly rose-mallow

valley elderberry longhorn beetle

vernal pool fairy shrimp

vernal pool tadpole shrimp

chinook salmon - Central Valley spring-run ESU

steelhead - Central Valley DPS

coast horned lizard

foothill yellow-legged frog

western pond turtle

western spadefoot

American peregrine falcon

bald eagle

burrowing owl

California black rail

least Bell's vireo

Swainson's hawk

tricolored blackbird

hoary bat

North American porcupine

pallid bat

silver-haired bat

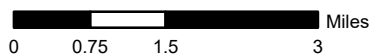
western mastiff bat

Within Sections 2,3,4, T21N,  
R02E, Butte County, CA  
Chico and Hamlin Canyon  
USGS 7.5' Quads



Imagery Source:  
ESRI - DigitalGlobe  
(4/21/2017)

#### CNDDDB Occurrences within 5 miles



1 inch = 2 miles

(printed at 8.5 x 11)

Map Date:  
15 June 2020

Drawn By:  
BSA

NSE Project #  
18-019

Parrott-Phelan Restoration  
- Butte County, CA -



**NORTHSTAR**  
... Designing Solutions

111 MISSION RANCH BLVD., SUITE 100 CHICO, CA 95926  
PHONE: (530) 893-1600 - www.NorthStarEng.com - © NorthStar

**Table 1. Special-status Species and Sensitive Natural Communities Identified by USFWS, CNDDDB, and CNPS as Potentially Occurring in the Biological Survey Area.**

<b>Common Name (Scientific Name)</b>	<b>Status Fed/State/ CNPS</b>	<b>Associated Habitats</b>	<b>Potential for Occurrence*</b>
<b>SENSITIVE NATURAL COMMUNITIES</b>			
<b>Coastal and Valley Freshwater Marsh</b>	__/SNC/__	Occurs near river mouths, oxbows, and other areas in the floodplain, and along margins of lakes and springs, where water is quiet and permanently flooded by freshwater. Dominated by perennial, emergent monocots 4-5 meters tall.	<u>None</u> : Does not occur within the BSA.
<b>Great Valley Cottonwood Riparian Forest</b>	__/SNC/__	Perennial creeks and rivers in the Central Valley.	<u>None</u> : Does not occur within the BSA.
<b>Great Valley Mixed Riparian Forest</b>	__/SNC/__	A tall, dense, winter-deciduous, broadleaved riparian forest. The tree canopy is usually fairly well closed and moderately to densely stocked with several species including <i>Acer negundo</i> , <i>Juglans hindsii</i> , <i>Platanus racemosa</i> , <i>Populus fremontii</i> , and <i>Salix</i> spp.	<u>None</u> : Does not occur within the BSA.
<b>Great Valley Valley Oak Riparian Forest</b>	__/SNC/__	Occurs on the deep alluvial soils of higher floodplain terraces in association with river systems. Can also be found in other upland communities.	<u>None</u> : Does not occur within the BSA.
<b>Great Valley Willow Scrub</b>	__/SNC/__	Pioneer riparian community found on depositional areas near the edge of intermittent and perennial creeks and rivers.	<u>None</u> : Habitat occurs within the BSA
<b>Northern Basalt Flow Vernal Pool</b>	__/SNC/__	Associated with low- to mid-elevation seasonally flooded depressions on impermeable soils.	<u>None</u> : Does not occur within the BSA.
<b>Northern Hardpan Vernal Pool</b>	__/SNC/__	Seasonally flooded depressions on impermeable soils or rock.	<u>None</u> : Does not occur within the BSA..
<b>Northern Volcanic Mud Flow Vernal Pool</b>	__/SNC/__	Seasonally flooded depressions on impermeable soils or rock.	<u>None</u> : Does not occur within the BSA.
<b>PLANTS</b>			
<b>Adobe Lily (<i>Fritillaria pluriflora</i>)</b>	__/_/1B.2	Chaparral, cismontane woodland, valley and foothill grassland. (Feb-Apr)	<u>Low</u> : Sub-marginal habitat present in the BSA. Nearest known occurrence is approximately 7.5 miles northeast of the BSA.
<b>Adobe Navarretia (<i>Navarretia nigelliformis</i> ssp. <i>nigelliformis</i>)</b>	__/_/4.2	Woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, vernal pools. (Apr-Jul)	<u>Low</u> : Sub-marginal grassland habitat and no vernal pool habitat present in the BSA. Nearest known occurrence is approximately 2.75 miles south of the BSA.
<b>Ahart's Buckwheat (<i>Eriogonum umbellatum</i> var. <i>ahartii</i>)</b>	__/_/1B.2	Serpentine soils, openings, and slopes in chaparral and cismontane woodland. (Jun-Sep)	<u>None</u> : No suitable chaparral or woodland habitat present within the BSA.



<b>Common Name (Scientific Name)</b>	<b>Status Fed/State/ CNPS</b>	<b>Associated Habitats</b>	<b>Potential for Occurrence*</b>
<b>Ahart's Paronychia</b> ( <i>Paronychia ahartii</i> )	___/___/1B.1	Cismontane woodland, valley and foothill grassland, and vernal pools. (Mar-Jun)	<u>Low</u> : Sub-marginal grassland habitat and no vernal pool habitat present within the BSA.
<b>Bidwell's knotweed</b> ( <i>Polygonum bidweliae</i> )	___/___/4.3	Grows in chaparral, woodland, and grassland habitat on volcanic soils.	<u>Low</u> : Sub-marginal habitat present within the BSA.
<b>Big-scale Balsam Root</b> ( <i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i> )	___/___/1B.2	Cismontane woodlands and chaparral. Valley and Foothill grasslands. Sometimes serpentinite. (Mar-June)	<u>Low</u> : Sub-marginal grassland habitat present within the BSA.
<b>Brassy Bryum</b> ( <i>Bryum chryseum</i> )	___/___/4.3	Chaparral (openings), cismontane woodlands, valley and foothill grassland.	<u>Low</u> : Sub-marginal grassland habitat present within the BSA.
<b>Brazilian Watermeal</b> ( <i>Wolffia brasiliensis</i> )	___/___/2B.3	Marshes and swamps (shallow freshwater). (Apr-Dec)	<u>Low</u> : Sub-marginal marsh and swamp habitat present within the BSA. Nearest known occurrence approximately 17 miles south of the BSA.
<b>Brownish Beaked-Rush</b> ( <i>Rhynchospora capitellata</i> )	___/___/2B.2	Lower montane coniferous forest, meadows and seeps, marshes and swamps, upper montane coniferous forest.	<u>Low</u> : Sub-marginal habitat present within the BSA.
<b>Butte County Calycadenia</b> ( <i>Calycadenia oppositifolia</i> )	___/___/4.2	Chaparral, cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland. (Apr-Jul)	<u>Low</u> : Sub-marginal grassland habitat present within the BSA.
<b>Butte County Checkerbloom</b> ( <i>Sidalcea robusta</i> )	___/___/1B.2	Chaparral and cismontane woodland. (Apr-Jun)	<u>None</u> : No suitable chaparral or woodland habitats present within the BSA.
<b>Butte County Fritillary</b> ( <i>Fritillaria eastwoodiae</i> )	___/___/3.2	Chaparral, cismontane woodland, openings in lower montane coniferous forests, sometimes serpentinite. (Mar-Jun)	<u>None</u> : No suitable chaparral or coniferous habitat present within the BSA.
<b>Butte County Golden Clover</b> ( <i>Trifolium jokerstii</i> )	___/___/1B.2	Valley and foothill grassland, vernal pools. (Mar-May)	<u>Low</u> : Sub-marginal grassland habitat and no vernal pool habitat present within the BSA. Additionally, most occurrences are around Table Mountain near Oroville, CA.
<b>Butte County Meadowfoam</b> ( <i>Limnanthes floccosa</i> ssp. <i>californica</i> )	FE/SE/1B.1	Valley and foothill grassland, vernal pools. (Mar-May)	<u>None</u> : No vernal pool habitat present within the BSA. Nearest known occurrence is approximately 1 mile northwest of the BSA. Species not observed during biological surveys of the BSA.
<b>Butte County Morning-glory</b> ( <i>Calystegia atriplicifolia</i> ssp. <i>buttensis</i> )	___/___/4	Chaparral and rocky lower montane coniferous forest, sometimes roadsides. (May-Jul)	<u>None</u> : No suitable coniferous forest habitat present within the BSA.

<b>Common Name (Scientific Name)</b>	<b>Status Fed/State/ CNPS</b>	<b>Associated Habitats</b>	<b>Potential for Occurrence*</b>
<b>California Beaked-rush</b> ( <i>Rhynchospora californica</i> )	___/___/1B.1	Bogs and fens, lower montane coniferous forest, meadows and seeps, and marshes and swamps. (May-Jul)	<u>None</u> : No suitable habitat present within the BSA.
<b>California Satintail</b> ( <i>Imperata brevifolia</i> )	___/___/2B.1	Chaparral, coastal scrub, Mojavean desert scrub, meadows and seeps (often alkali), and mesic riparian scrub, 0-500 meters. (Sep-May)	<u>Low</u> : Marginal habitat present within the BSA. Nearest known occurrence is approximately 6 miles northeast of the BSA.
<b>Dissected-leaved Toothwort</b> ( <i>Cardamine pachystigma</i> var. <i>dissectifolia</i> )	___/___/3	Chaparral and lower montane coniferous forests, usually serpentinite and rocky. (Feb-May)	<u>None</u> : No suitable chaparral or coniferous forest habitat present within the BSA.
<b>Depauperate Milk-Vetch</b> ( <i>Astragalus pauperculus</i> )	___/___/4.3	Vernally mesic, volcanic, chaparral, cismontane woodland, valley and foothill grassland. (Mar-Jun)	<u>Low</u> : Marginal grassland habitat present within the BSA. Nearest known occurrence is approximately 4.8 miles north of the BSA.
<b>Ferris's Milk-vetch</b> ( <i>Astragalus tener</i> var. <i>ferrisiae</i> )	___/___/1B.1	Meadows and seeps, valley and foothill grassland. (Apr-May)	<u>Low</u> : Sub-marginal habitat present within the BSA.
<b>Flagella-like Atractylodes</b> ( <i>Campylopodella stenocarpa</i> )	___/___/2B.2	Cismontane woodland, 100-500 meters.	<u>None</u> : No suitable woodland habitat present within the BSA.
<b>Greene's Tuctoria</b> ( <i>Tuctoria greenei</i> )	FE/___/1B.1	Vernal pools. (May-Jul/Sept)	<u>None</u> : No vernal pool habitat present in the within the BSA.
<b>Hairy Orcutt Grass</b> ( <i>Orcuttia pilosa</i> )	FE/SE/1B	Deep vernal pools. (May-Sept)	<u>None</u> : No vernal pool habitat present within the BSA.
<b>Hogwallow Starfish</b> ( <i>Hesperex caulescens</i> )	___/___/4.2	Sometimes alkaline. Valley and foothill grassland (mesic, clay), vernal pools (shallow). (Mar-Jun)	<u>None</u> : No suitable habitat present within the BSA.
<b>Hoover's Spurge</b> ( <i>Chamaesyce hooveri</i> )	FT/___/1B.2	Vernal pools. (Jul-Sep/Oct)	<u>None</u> : No vernal pool habitat present in the within the BSA.
<b>Humboldt Lily</b> ( <i>Lilium humboldtii</i> ssp. <i>humboldtii</i> )	___/___/4.2	Openings. Chaparral. Cismontane woodland, and lower montane coniferous forest. (May-Jul(Aug))	<u>None</u> : No suitable habitat present within the BSA.
<b>Marsh Claytonia</b> ( <i>Claytonia palustris</i> )	___/___/4.3	Meadows and seeps (mesic). Marshes and swamps. Upper montane coniferous forest. (May-Oct)	<u>None</u> : No suitable habitat present within the BSA.
<b>Mexican mosquito fern</b> ( <i>Azolla microphylla</i> )	___/___/4.2	Marshes and swamps (ponds, slow water). (Aug)	<u>Low</u> : Sub-marginal habitat present within the BSA. Nearest known occurrence is approximately 6 miles north of the BSA.
<b>Parry's rough tarplant</b> ( <i>Centromadia parryi</i> ssp. <i>Rudis</i> )	___/___/4.2	Alkaline, vernally mesic, seeps, sometimes roadsides. Valley and foothill grassland. Vernal pools. (May-Oct)	<u>Low</u> : Sub-marginal grassland habitat and no vernal pool habitat present within the BSA. Nearest known occurrence is approximately 11 miles southwest of the BSA.

<b>Common Name (Scientific Name)</b>	<b>Status Fed/State/ CNPS</b>	<b>Associated Habitats</b>	<b>Potential for Occurrence*</b>
<b>Pink Creamsacs</b> ( <i>Castilleja rubicundula</i> ssp. <i>rubicundula</i> )	___/___/1B.2	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland (serpentine). (Apr-Jun)	<u>Low</u> : Sub-marginal grassland habitat present within the BSA. Nearest known occurrence is approximately 5.8 miles east of the BSA.
<b>Recurved Larkspur</b> ( <i>Delphinium recurvatum</i> )	___/___/1B.2	Chenopod scrub, cismontane woodland, valley and foothill grassland (alkaline). (Mar-Jun)	<u>Low</u> : Sub-marginal grassland habitat present within the BSA. Nearest known occurrence is approximately 9 miles south of the BSA.
<b>Red Bluff Dwarf Rush</b> ( <i>Juncus leiospermus</i> var. <i>leiospermus</i> )	___/___/1B.1	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland and vernal pools/vernally mesic habitats. (Mar-May)	<u>Low</u> : Sub-marginal grassland habitat and no vernal pool habitat present within the BSA. Nearest known occurrence is approximately 8.5 miles east of the BSA.
<b>Shield-bracted monkeyflower</b> ( <i>Erythranthe glaucescens</i> )	___/___/4.3	Serpentine seeps, sometimes streambanks. Chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland. (Feb-Aug(Sep))	<u>Low</u> : Sub-marginal habitat present within the BSA due to the dynamic hydrologic regime of Butte Creek.
<b>Silky Cryptantha</b> ( <i>Cryptantha crinita</i> )	___/___/1B	Cismontane woodland, lower montane coniferous forest, riparian forest and woodland, gravelly streambeds in valley and foothill grassland. (Apr-May)	<u>Low</u> : Sub-marginal habitat present within BSA. Nearest known occurrence is approximately 10 miles west of the BSA.
<b>Slender-leaved Pondweed</b> ( <i>Stuckenia filiformis</i> ssp <i>alpina</i> )	___/___/2B.2	Marshes and swamps (assorted shallow freshwater). (May-July)	<u>None</u> : No suitable marsh or swamp habitat present within the BSA.
<b>Tehama navarretia</b> ( <i>Navarretia heterandra</i> )	___/___/4.3	Valley and foothill grassland (mesic). Vernal pools. (Apr-Jun)	<u>Low</u> : Sub-marginal grassland habitat and no vernal pool habitat present. Nearest known occurrence is approximately 2.25 miles northwest of the BSA.
<b>Veiny Monardella</b> ( <i>Monardella venosa</i> )	___/___/1B.1	Cismontane woodlands. Valley and foothill grasslands in heavy clay soils. (May-July)	<u>None</u> : Sub-marginal grassland habitat present within the BSA. Nearest known occurrence is approximately 2.6 miles south of the BSA. Species not observed during biological surveys of the BSA.
<b>Watershield</b> ( <i>Brasenia schreberi</i> )	___/___/2B.3	Freshwater marshes and swamps. (Jun- Sep)	<u>None</u> : No suitable habitat present within the BSA.
<b>White-stemmed Clarkia</b> ( <i>Clarkia gracilis</i> ssp. <i>albicaulis</i> )	___/___/1B.2	Chaparral and cismontane woodland (sometimes serpentine). (May-Jul)	<u>None</u> : No suitable chaparral or woodland habitat present within the BSA.

<b>Common Name (Scientific Name)</b>	<b>Status Fed/State/ CNPS</b>	<b>Associated Habitats</b>	<b>Potential for Occurrence*</b>
<b>Woolly meadowfoam</b> ( <i>Limnanthes floccosa</i> ssp. <i>floccosa</i> )	___/___/4	Edge of vernal pools at elevations of 375 to 400 meters. (Mar-Apr)	<u>None</u> : No suitable vernal pool habitat present within the BSA.
<b>Woolly Rose-mallow</b> ( <i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i> )	___/___/1B.2	Marshes and swamps (freshwater). (Jun-Sep)	<u>None</u> : Sub-marginal habitat present within the BSA. Nearest known occurrence is approximately 7 miles south of the BSA. Species not observed during biological surveys of the BSA.
<b>INVERTEBRATES</b>			
<b>Antioch Dunes Anthicid Beetle</b> ( <i>Anthicus antiochensis</i> )	___/___/___	Interior sand dunes and sand bars.	<u>None</u> : No sand dune or sand bar habitat present within the BSA.
<b>California Linderiella</b> ( <i>Linderiella occidentalis</i> )	___/___/___	Vernal pools, swales, and ephemeral freshwater habitat.	<u>None</u> : No vernal pool habitat present within the BSA.
<b>Conservancy Fairy Shrimp</b> ( <i>Branchinecta conservatio</i> )	FE/___/___	Moderately turbid, deep, cool-water vernal pool	<u>None</u> : No vernal pool habitat present within the BSA. Nearest known occurrence is approximately 10.5 miles north of the BSA.
<b>Midvalley fairy shrimp</b> ( <i>Branchinecta mesovallensis</i> )	___/___/___	Vernal pools, swales, and ephemeral freshwater habitat	<u>None</u> : No vernal pool habitat present within the BSA.
<b>Sacramento Anthicid Beetle</b> ( <i>Anthicus sacramento</i> )	___/___/___	Interior sand dunes and sand bars; has also been found in dredge spoil heaps. Known occurrences along the Sacramento and San Joaquin rivers from Shasta to San Joaquin counties and at one site along the Feather River at Nicolaus.	<u>None</u> : No dune, sandbar or dredge spoil habitat present within the BSA.
<b>Valley Elderberry Longhorn Beetle</b> ( <i>Desmocerus californicus dimorphus</i> )	FT/___/___	Blue elderberry shrubs usually associated with riparian areas.	<u>Moderate</u> : One large blue elderberry present within the BSA. Nearest known occurrence is approximately 1.5 miles southeast of the BSA.
<b>Vernal Pool Fairy Shrimp</b> ( <i>Branchinecta lynchi</i> )	FT/___/___	Vernal pools, swales, and ephemeral freshwater habitat.	<u>None</u> : No suitable vernal pool habitat present in the BSA.
<b>Vernal Pool Tadpole Shrimp</b> ( <i>Lepidurus packardii</i> )	FE/___/___	Vernal pools, swales, and ephemeral freshwater habitat.	<u>None</u> : No suitable vernal pool habitat present in the BSA.

FISH			
<b>Central Valley Fall/ Late Fall-Run Chinook Salmon</b> ( <i>Oncorhynchus tshawytscha</i> )	FC/ __/ __	Sacramento River and tributaries.	<u>Known:</u> Species is known to be present in Butte Creek and have been documented within the BSA.
<b>Central Valley Spring-Run Chinook Salmon</b> ( <i>Oncorhynchus tshawytscha</i> )	FT/ST/ __	Sacramento River and tributaries.	<u>Known:</u> Species is known to be present in Butte Creek and have been documented within the BSA.
<b>Central Valley Steelhead</b> ( <i>Oncorhynchus mykiss</i> )	FT/ __/ __	Sacramento and San Joaquin Rivers and their tributaries.	<u>Known:</u> Species is known to be present in Butte Creek and have been documented within the BSA.
<b>Delta Smelt</b> ( <i>Hypomesus transpacificus</i> )	FT/ST/ __	Sacramento-San Joaquin Estuary	<u>None:</u> No suitable or critical habitat within the BSA.
REPTILES AND AMPHIBIANS			
<b>California Red-legged Frog</b> ( <i>Rana draytonii</i> )	FT/ __/ __	Inhabits quiet pools of streams, marshes, and occasionally ponds.	<u>None:</u> Sub-marginal habitat present within the BSA. No critical habitat present within the BSA. Nearest known occurrence is approximately 18.5 miles east of the BSA. Presumed extirpated from the valley. Additionally, the habitat within the BSA supports a population of invasive, non-native American Bullfrogs, which often outcompete California red-legged frogs where they overlap.
<b>Coast Horned Lizard</b> ( <i>Phrynosoma blainvillii</i> )	__/SSC/ __	Occurs in openings in valley foothill hardwood, coniferous, riparian habitats, pine-cypress, juniper, and annual grassland habitats with sandy soils and presence of ants.	<u>Low:</u> Sub-marginal grassland habitat present within the BSA. Nearest known occurrence is approximately 4.5 miles east.
<b>Foothill Yellow-legged Frog</b> ( <i>Oncorhynchus mykiss</i> )	__/ST/ __	Partly-shaded, shallow streams and riffles with cobble-sized substrate for egg-laying.	<u>Known:</u> Suitable habitat is present within the BSA and a known occurrence overlaps with the BSA.
<b>Giant Garter Snake</b> ( <i>Thamnophis gigas</i> )	FT/ST/ __	Agricultural wetlands and other wetlands such as irrigation and drainage canals, low gradient streams, marshes, ponds, sloughs, small lakes, and their associated uplands.	<u>None:</u> No suitable habitat present within the BSA. Nearest known occurrence is approximately 10 miles south of the BSA.
<b>Northwestern Pond Turtle</b> ( <i>Actinemys marmorata marmorata</i> )	__/SSC/ __	Associated with permanent ponds, lakes, streams, and irrigation ditches or permanent pools along intermittent streams.	<u>High:</u> Habitat present within the BSA and species known to occur in Butte Creek.
<b>Western Spadefoot</b> ( <i>Spea hammondi</i> )	__/SSC/ __	Grassland and woodland and vernal pools without aquatic predators for breeding.	<u>None:</u> No vernal pool habitat present within the

			BSA. Nearest known occurrence is approximately 4.85 miles north of the BSA.
BIRDS			
<b>American peregrine falcon</b> ( <i>Falco peregrinus anatum</i> )	__/_/	Breeding Peregrine Falcons utilize habitats containing cliffs and almost always nest near water. Open habitats for foraging. Non-breeding Peregrine Falcons may also occur in open areas without cliffs.	<u>Low</u> : No suitable nesting habitat within or directly adjacent to the BSA. Sub-marginal foraging habitat present within the BSA.
<b>Bald Eagle</b> ( <i>Haliaeetus leucocephalus</i> )	__/_SE/	Lakes, rivers, estuaries, reservoirs and some coastal habitats.	<u>Moderate</u> : Suitable nesting and foraging habitat present within the BSA. No stick nest observed during survey. Nearest known occurrence approximately 4.5 miles northwest of the BSA.
<b>Bank Swallow</b> ( <i>Riparia riparia</i> )	__/_ST/	Nests in steep riverbank cliffs, gravel pits, and highway cuts.	<u>None</u> : No suitable riverbank cliffs or other nesting habitat present within the BSA.
<b>Burrowing Owl</b> ( <i>Athene cunicularia</i> )	__/_SSC/	Nests in burrows in the ground, often in old ground squirrel burrows or badger, within open dry grassland and desert habitat.	<u>Low</u> : Sub-marginal grassland habitat and non-friable soil within the BSA.
<b>California Black Rail</b> ( <i>Laterallus jamaicensis coturniculus</i> )	__/_ST/	Yearlong resident of saline, brackish, and fresh emergent wetlands in the San Francisco Bay Area, Sacramento-San Joaquin Delta, coastal Southern California, the Salton Sea and lower Colorado River area.	<u>Low</u> : Sub-marginal habitat present within the BSA. Nearest known occurrence is approximately 3.5 miles northeast of the BSA.
<b>Great Blue Heron (rookery)</b> ( <i>Ardea herodias</i> )	MBTA/ __/_/	Common all year throughout California, in shallow estuaries and fresh and saline emergent wetlands. Nests in colonies in tops of secluded large snags or live trees.	<u>Low</u> : Sub-marginal rookery habitat present within the BSA.
<b>Great Egret (rookery)</b> ( <i>Ardea alba</i> )	__/_CDF Sensitive/	Communally nests in large trees in groves near aquatic foraging areas	<u>Low</u> : Sub-marginal rookery habitat present within the BSA..
<b>Least Bell's Vireo</b> ( <i>Vireo bellii pusillus</i> )	FE/SE/	Riparian forests, woodlands, scrubs.	<u>Low</u> : Suitable habitat present within the BSA. No records in Butte County since 1906. Nearest "recent" occurrence is from 2009 in the Yolo bypass approximately 80 miles south of BSA.
<b>Loggerhead Shrike</b> ( <i>Lanius ludovicianus</i> )	__/_SSC/	Open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low or sparse herbaceous cover	<u>None</u> : No suitable habitat present within the BSA.
<b>Osprey</b> ( <i>Pandion haliaetus</i> )	MBTA/ SSC/	Wetland, open water.	<u>Moderate</u> : Suitable habitat present within the BSA. Nearest known occurrence is approximately 3.5 northwest of BSA.

<b>Swainson's Hawk</b> ( <i>Buteo swainsoni</i> )	___/ST/___	Nests in isolated trees or riparian woodlands adjacent to suitable foraging habitat including grasslands or suitable grain or alfalfa fields, or livestock pastures.	<u>Low</u> : Marginal nesting habitat and sub-marginal foraging habitat present in the BSA. Nearest known nesting occurrence is from 1985 approximately 9.25 miles southwest of the BSA.
<b>Tri-colored Blackbird</b> ( <i>Agelaius tricolor</i> )	___/SSC/___	Nests in dense blackberry, cattail, tules, willow, or wild rose within emergent wetlands throughout the Central valley and foothills surrounding the valley.	<u>None</u> : No suitable habitat present within the BSA.
<b>Western Yellow-billed Cuckoo</b> ( <i>Coccyzus americanus occidentalis</i> )	FT/SE/___	Structured dense riparian forest generally willows.	<u>Low</u> : Marginal riparian forest habitat present within the BSA. No records of occurrences on Butte Creek.
<b>Yellow Warbler</b> ( <i>Setophaga petechia</i> )	___/SSC/___	Very partial to riparian woodlands of the lowlands and foothill canyons.	<u>High</u> : Suitable riparian habitat present and known occurrences immediately adjacent to the BSA. Expected as a migrant, unlikely to breed at this location.
<b>Migratory Birds and Raptors</b>	MBTA	Nest and forage in a variety of habitats including hardwood woodlands, coniferous forests, meadows, grasslands and riparian.	<u>Known</u> : Suitable foraging and nesting habitat present within the BSA. Species protected by the MBTA observed during biological surveys of the BSA.
<b>MAMMALS</b>			
<b>American Badger</b> ( <i>Taxidea taxus</i> )	___/SSC/___	Grasslands, savannahs, and mountain meadows with friable soils.	<u>Low</u> : Sub-marginal soil and grassland habitat within the BSA.
<b>Hoary Bat</b> ( <i>Lasiurus cinereus</i> )	___/___/___	Roosting habitat includes woodlands and forests with medium to large-sized trees and dense foliage. Adjacent open areas are required for feeding.	<u>High</u> : Suitable roosting habitat present within the BSA. Nearest known occurrence is approximately 3.8 miles northwest of the BSA.
<b>North American porcupine</b> ( <i>Erethizon dorsatum</i> )	___/___/___	Coniferous, deciduous and mixed forests. Prefers scrubby areas	<u>High</u> : Suitable habitat present and nearest known occurrence is approximately 500' from BSA.
<b>Pallid Bat</b> ( <i>Antrozous pallidus</i> )	___/SSC/___	Arid and semi-arid habitats; roosts in rock crevices, caves, and mine shafts.	<u>Low</u> : Sub-marginal roosting habitat present within the BSA.
<b>Silver-haired Bat</b> ( <i>Lasionycteris noctivagans</i> )	___/___/___	Coniferous and mixed deciduous forest as well as riparian areas.	<u>Moderate</u> : Suitable roosting and foraging habitat present within the BSA. Nearest known occurrence is approximately 10.75 miles northwest of the BSA.
<b>Western Mastiff Bat</b> ( <i>Eumops perotis californicus</i> )	___/SSC/___	Common species of low elevations in California. Crevices in steep cliff faces or in the roof eaves of buildings of two or more stories (needs vertical faces to take	<u>Low</u> : No suitable roosting habitat present within the BSA, although surrounding cliffs could provide roost

		flight).	habitat. Sub-marginal. foraging habitat present in the BSA.
<b>Western Red Bat</b> ( <i>Lasiurus blossevillei</i> )	—/SSC/—	Roosting habitat includes forest and broadleaf woodlands from sea level to coniferous forest. Feeds over grasslands, shrublands, open woodlands, and croplands. Known to occur from Shasta County to the Mexican border – often in riparian habitats.	<u>Moderate</u> : Suitable roosting and foraging habitat present within the BSA. Nearest known occurrence approximately 10.5 miles west of the BSA.
<b>Yuma Myotis</b> ( <i>Myotis yumanensis</i> )	—/_/_	Woodland and forested areas, large buildings and abandoned mine tunnels within one-half mile of a surface water source; abandoned swallow nests under bridges.	<u>Moderate</u> : Suitable roosting and foraging habitat present within the BSA. Nearest known occurrence approximately 10 miles west of the BSA.
<p style="text-align: center;"><b>CODE DESIGNATIONS</b></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><b>FE</b> = Federally-listed Endangered  <b>FT</b> = Federally-listed Threatened  <b>FC</b> = Federal Candidate Species  <b>BCC</b> = Federal Bird of Conservation Concern  <b>MBTA</b> = protected by the federal Migratory Bird Treaty Act</p> <p><b>SE</b> = State-listed Endangered  <b>ST</b> = State-listed Threatened  <b>SH</b> = Presumed extinct in California</p> </div> <div style="width: 45%;"> <p><b>SSC</b> = CDFW Species of Special Concern  <b>FP</b> = CDFW Fully Protected Species  <b>SNC</b> = CDFW Sensitive Natural Community</p> <p><b>CNPS 1B</b> = Rare or Endangered in California or elsewhere  <b>CNPS 2</b> = rare or Endangered in California, more common elsewhere  <b>CNPS 3</b> = More information is needed  <b>CNPS 4</b> = Plants with limited distribution</p> </div> </div> <p><b>*Potential for occurrence:</b> for plants it is considered the potential to occur during the survey period; for birds and bats it is considered the potential to breed, forage, roost, over-winter, or stop-over in the BSA during migration. Any bird or bat species could fly over the BSA, but this is not considered a potential for occurrence. The categories for the potential for occurrence include:  <b>None:</b> The species or natural community is known not to occur, and has no potential to occur in the BSA based on sufficient surveys, the lack of suitable habitat, and/or the BSA is well outside of the known distribution of the species.  <b>Low:</b> Potential habitat in the BSA is sub-marginal and the species is not known to occur in the vicinity of the BSA. Protocol-level surveys are not recommended.  <b>Moderate:</b> Suitable habitat is present in the BSA and the species is known to occur in the vicinity of the BSA.  <b>High:</b> Habitat in the BSA is highly suitable for the species and there are reliable records close to the BSA, but the species was not observed.  <b>Known:</b> Species was detected in the BSA or a recent reliable record exists for the BSA.</p>			

Only species with moderate, high or known potential of occurring within the BSA are discussed in the following section. Species with no or a low potential to occur within the BSA are not discussed further because the potential for these species to occur is negligible.

#### 4.6.1 *Plants*

The majority of the terrestrial landscape within the BSA is composed of riparian habitat. No special-status plant species were observed within the riparian habitat of the BSA during surveys or found to be known to occur when referencing historical data. The grassland habitat within the BSA is heavily disturbed and is predominately comprised of introduced and invasive grass species, resulting in a lack of suitable habitat for many of the special-status plant species listed on **Table 1**. No special-status species were determined to have the potential to occur on site within the BSA.

#### 4.6.2 *Invertebrates*

One special-status invertebrate species, the valley elderberry longhorn beetle, was found to have the potential to occur within the BSA.



### Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (VELB) is federally listed as threatened and critical habitat has been designated by the USFWS. The beetle is endemic to riparian systems along the margins of rivers and streams, and in adjacent grassy savannas in California's Central Valley. The VELB occurs in the Central Valley of California below 3,000 feet. It is distributed primarily within riparian habitats from Shasta County to Kern County. Valley elderberry longhorn beetles feed and reproduce exclusively on two species of elderberry, including blue elderberry and red elderberry (*Sambucus racemosa*). The adult female beetles deposit eggs in the bark crevices of living plants. Larvae bore into the pith (plant tissue in the center of the stem) of larger elderberry stems upon hatching, where the majority of the animal's life-span occurs. Following pupation in the spring, the adult beetle emerges, creating a hole in the bark of the stem or branch. Adults feed on foliage and are present from March through early June. Because the adult stage is short lived, survey techniques focus on the presence of emergence holes for evidence of VELB. Valley elderberry longhorn beetle emergence holes have been observed in shoots or branches with diameters as small as 0.5 inches (13 mm) but are more common in older, larger branches. Besides exhibiting a preference for "stressed" elderberry shrubs, VELB prefer shrubs with stems of a certain size class. Exit holes have been found more frequently in trunks or branches that are 5 to 20 cm (2-8 in) in diameter, or at least 1.0 inch or greater at ground height (USFWS 1999) and less than one meter off the ground (Collinge et al. 2001). Research also shows that exit holes more consistently occur in clusters or stands of elderberry shrubs surrounded by associate riparian vegetation, rather than in isolated shrubs (Collinge et al. 2001). Exit holes are circular to slightly oval and are usually 7-10 mm in diameter. Valley elderberry longhorn beetles are the only insect species known to inhabit live elderberry shrubs and/or make exit holes of a similar size and shape in the Central Valley (USFWS 1991).

The lone blue elderberry shrub that occurs within the BSA is situated along the south side of Honey Run Road in between the two areas where work will be taking place, making it unlikely to be disturbed by project activities. No VELBs or exit holes were observed during surveys. Additionally the nearest known occurrence is approximately 1.5 miles southwest of the BSA, which is a relatively long distance for the poorly dispersing VELB.

### 4.6.3 *Fish*

Three special-status fish species, the Central Valley fall and late fall-run Chinook salmon Central Valley spring-run Chinook salmon and the Central Valley steelhead, were determined to have the potential to occur within the BSA.

#### Central Valley Fall and Late Fall-Run Chinook Salmon

Fall-run Chinook salmon (*Oncorhynchus tshawytscha*) were historically the most abundant run of Central Valley Chinook salmon (Fisher, 1994). They occupied the entire Sacramento and San Joaquin River drainages, but the numbers were reduced beginning in the mid 1900's as a result of commercial fishing, blockage from historical spawning and rearing habitat, water-flow fluctuations, unsuitable water temperatures, and reduction of habitat quality. The fish currently inhabit river reaches downstream of major dams on Central Valley Rivers, including the Sacramento, Feather, Yuba, American, Mokelumne, Stanislaus, Tuolumne, and Merced, as well as smaller tributaries to the Sacramento River and the Delta.

On March 9, 1998 (63 FR 11481), NOAA Fisheries issued a proposed rule to list fall-run Chinook salmon as threatened, but on September 16, 1999 (64 FR 50393), NOAA Fisheries determined that they did not warrant being listed as threatened and downgraded them to candidate status. NOAA Fisheries indicated that the Central Valley fall-run and late fall-run Chinook salmon is a single ESU. They are discussed together in this section even though there are some differences in life history for the two runs. There is no state protection for fall-run Chinook salmon.

After 2 to 4 years of maturation in the ocean, adult Chinook salmon return to their natal freshwater streams to spawn. Adult fall-run Chinook salmon migrate upstream between mid-September and December, with peak migrations occurring between October and November. Newly emerged fry remain in shallow, lower velocity edge waters, particularly where debris congregates and makes the fish less visible to predators (California Department of Fish and Game, 1998).

Juvenile fall-run and late fall-run Chinook salmon rear from January to June. Occurrence of fall-run peaks between February and May. Cover, space, and food are necessary components of fall-run Chinook salmon rearing habitat. Suitable habitat includes areas with in stream and overhead cover in the form of undercut banks, downed trees, and large, overhanging tree branches. The organic materials that form fish cover also help provide sources of food, such as aquatic and terrestrial insects. Once the fry emerge from the gravel, they typically spend little time rearing in the river. The emigration period is generally December through June, with the peak sometime between January and March (DWR unpublished data). A small number of fall salmon (5,000-15,000) may continue to rear in the river throughout the summer.

Fall and late fall-run Chinook salmon typically arrive in Butte Creek in September and October and peak spawning occurs in October and November, but can continue into January. Juveniles emerge from the gravel beds from December to March, and although they may remain in freshwater systems for up to 7 months, they typically quickly move out of the smaller tributaries into larger river systems within a few weeks.

Fall and late fall-run Chinook salmon can be found within the BSA from October until March. A long term CDFW study, including trapping efforts, has been, and continues to be, conducted at the Parrott-Phelan diversion dam. Typically, CDFW installs an exclusion barrier within the fish ladder to keep fall and late fall run Chinook salmon from entering the upper portions of Butte Creek where they can disturb redds created by spring-run Chinook salmon. In most years, fall and late fall-run Chinook salmon spawn lower in Butte Creek below the BSA due to the exclusion barrier.

#### Central Valley Spring-Run Chinook Salmon

Spring-run Chinook salmon (*Oncorhynchus tshawytscha*) were historically the second most abundant run of Central Valley Chinook salmon (Fisher, 1994). Adults returning to spawn ascended the tributaries to the upper Sacramento River, including the Pit, McCloud, and Little Sacramento Rivers. They also occupied Cottonwood, Battle, Antelope, Mill, Deer, Stony, Big Chico, and Butte Creeks, and the Feather, Yuba, American, Mokelumne, Stanislaus, Tuolumne, Merced, San Joaquin, and Kings Rivers. Spring-run Chinook salmon, similar to steelhead, migrated into headwater streams where cool, well-oxygenated water is available year-round.

Current surveys indicate that remnant; non-sustaining spring-run Chinook salmon populations may be found in Cottonwood, Battle, Antelope, and Big Chico Creeks (California Department of Water

Resources, 1977). More sizeable, consistent runs of naturally produced fish are found in Mill, Deer, and Butte Creeks. The Feather River Fish Hatchery sustains the spring-run population on the Feather River, but the genetic integrity of that run is questionable (California Department of Water Resources, 1977). Feather River water has been diverted to Butte Creek for many years. However, the degree of straying of Feather River spring-run Chinook salmon into Butte Creek is assumed to be very limited. Spring-run Chinook salmon may occur in the Yuba River; however, the size of the run and the level of possible hybridization with fall-run Chinook salmon are unknown (California Department of Fish and Game, 1998).

On March 9, 1998 (68 FR 11481), NOAA Fisheries issued a proposed rule to list spring-run Chinook salmon, and on September 16, 1999 (64 FR 50393), NOAA Fisheries listed spring-run Chinook salmon as threatened. NOAA Fisheries designated critical habitat for spring-run Chinook salmon of February 16, 2000 (65 FR 7764). On February 5, 1999, the California Fish and Game Commission listed spring-run Chinook salmon as threatened under the California ESA. Spring-run Chinook tend to spawn almost exclusively in the Low Flow Channel.

Spring-run Chinook salmon typically arrive in Butte Creek mid-February. They are transients in the BSA, passing through on their way to deeper pools, further upstream, higher in the canyon, where they hold until spawning which occurs beginning in late September. During spawning they spread back out, but are not known to spawn as far down stream as the BSA. Juveniles can be found within the BSA, using backwaters and heading downstream, eventually to the ocean, from November to May. A long term CDFW study, focusing on juvenile spring-run Chinook salmon trapping efforts, continues to be conducted at the Parrott-Phelan diversion dam.

#### Central Valley Steelhead

The Central Valley steelhead (*Oncorhynchus mykiss*) DPS was Federally listed as threatened on March 19, 1998 (NMFS 1998b). The threatened status of Central Valley steelhead was reaffirmed in NMFS's final listing determination on January 5, 2006 (NMFS 2006a); at the same time NMFS also adopted the term DPS, in place of ESU, to describe Central Valley steelhead and other population segments of this species. NMFS originally designated critical habitat for Central Valley steelhead on February 16, 2000 (NMFS 2000). However, following a lawsuit (National Association of Home Builders et al. v. Donald L. Evans, Secretary of Commerce, et al.), NMFS decided to rescind the listing and re-evaluate how to classify critical habitat for several DPSs of steelhead.

Critical habitat for Central Valley steelhead was re-designated by NMFS on September 2, 2005 (NMFS 2005b). The DPS includes all naturally spawned populations of steelhead in the Sacramento and San Joaquin rivers and their tributaries, excluding steelhead from San Francisco and San Pablo Bays and their tributaries. Artificially propagated fish from the Coleman and Feather River hatcheries are included in the DPS (NMFS 2006a).

Steelhead ranged throughout the tributaries of the Sacramento and San Joaquin Rivers prior to dam construction, water development, and watershed perturbation dating from the 19th and 20th centuries. Wild stocks are now mostly confined to the upper Sacramento River downstream of Keswick Dam; upper Sacramento River tributaries such as Deer, Mill, and Antelope Creeks; and the Yuba River downstream of Englebright Dam. Populations may also exist in Big Chico and Butte Creeks and a few wild steelhead are produced in the American and Feather Rivers as well (McEwan and Jackson 1996). The abundance of naturally reproducing Central Valley steelhead,

as measured by the number of adults returning to spawn, is largely unknown. Natural escapement in 1995 was estimated to be about 1,000 adults each for Mill and Deer Creeks and the Yuba River (S. P. Cramer and Associates 1995). Hatchery returns have averaged around 10,000 adults (Mills and Fisher 1994). The most recent annual estimate of adults spawning upstream of Red Bluff Diversion Dam is less than 2,000 fish (NMFS 2006a).

Central Valley steelhead have one of the most complex life histories of any salmonid species, exhibiting both anadromous and freshwater resident life histories. Freshwater residents typically are referred to as rainbow trout, and those exhibiting an anadromous life history are called steelhead (NMFS 1999). Steelhead exhibit highly variable life history patterns throughout their range but are broadly categorized into winter and summer reproductive ecotypes. Winter steelhead are the most widespread reproductive ecotype and the only type currently present in Central Valley streams (McEwan and Jackson 1996). Winter steelhead become sexually mature in the ocean, enter spawning streams in summer, fall or winter, and spawn a few months later in winter or late spring (Meehan and Bjornn 1991; Behnke 1992).

In the Sacramento River and its tributaries, adult winter steelhead migrate upstream during most months of the year, beginning in July, peaking in September, and continuing through February or March (Hallock 1987). Spawning occurs primarily from January through March, but may begin as early as late December and may extend through April (Hallock 1987). Individual steelhead may spawn more than once, returning to the ocean between each spawning migration.

Juvenile steelhead rear a minimum of one and typically two or more years in fresh water before migrating to the ocean as smolts. Juvenile migration to the ocean generally occurs from December through August. The peak months of juvenile migration are January to May (McEwan 2001).

The decline in steelhead populations is attributable to changes in habitat quality and quantity. Steelhead habitat in the Central Valley has been reduced by as much as 95% or more due to barriers created by dams (NMFS 1996a). Populations have been most severely affected by dams blocking access to the headwaters of all major tributaries; consequently, most runs are maintained through artificial production. The decline of naturally produced Central Valley steelhead has been more precipitous than that of hatchery stocks. Populations in the range's southern portion have experienced the most severe declines (NMFS 1996b). Other factors contributing to the decline of steelhead in the Central Valley are mining, agriculture, urbanization, logging, harvest, hatchery influences, flow management (including reservoir operations), hydropower generation, and water diversion and extraction (NMFS 1996a).

Central Valley steelhead are present in the mainstem of the Sacramento River and a number of its tributaries, and have been well documented during all stages of development in Butte Creek. Central Valley Steelhead begin to move into Butte Creek in early winter, usually starting after the first winter rain events. Typically, they are transients within the BSA, passing through on their way further upstream to spawning grounds, but it is conceivable that they could spawn within the BSA as suitable gravel is present. After hatching juveniles can pass through the BSA on their out migrations.

#### 4.6.4 *Reptiles and Amphibians*

One special-status amphibian, the foothill yellow-legged frog, and one special-status reptile, the northwestern pond turtle, were determined to have potential to occur within the BSA.

### Foothill Yellow-legged Frog

The yellow-legged frog (*Rana boylei*) is a state threatened candidate species which occurs along the Coast Range of California, to the Transverse Mountains in Los Angeles County, and throughout most of northern California west of the Cascade crest. It can be found in or near rocky streams in a variety of habitats including valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadows. Adult yellow-legged frogs eat both aquatic and terrestrial invertebrates and yellow-legged frog tadpoles generally graze on algae and diatoms on rocky stream bottoms. The foothill yellow-legged frog is typically found in partly shaded, shallow streams and riffles with a rocky substrate in a variety of aquatic habitats. They generally prefer low-to moderate-gradient streams, especially for breeding and egg-laying, requiring at least some cobble-sized substrate for egg-laying, which they do following the end of spring flooding (mid-March to May).

During the summer and fall, adult frogs prefer stream channels that provide exposed basking sites and cool shady areas. The tadpoles require water for at least 3 to 4 months while continuing to develop, hence the yellow-legged frog is rarely found far from permanent water sources. Garter snakes (*Thamnophis* sp.) and bullfrogs (*Lithobates catesbeianus*) have been documented as predators of the yellow-legged frog.

On August 12, 2019 NorthStar biologist Matt Rogers and environmental scientist Aly Johnson conducted a foothill yellow-legged frog survey within the BSA. The BSA was visually searched for foothill yellow-legged frog of any age class. Despite seemingly suitable habitat, no foothill yellow-legged frogs were encountered, likely due to the considerable presence of predatory fish and invasive American bullfrogs within the BSA.

There is a known occurrence from CNDDDB of foothill yellow-legged frog within the BSA on September 19, 2006, and the species is well documented along Butte Creek. However, most known occurrences occur farther upstream where the creek is tumbling down the canyon as opposed to the location of the BSA where the topography begins to flatten, and the creek slows. In the lower, slower stretches of Butte Creek where the non-native invasive American bullfrog has taken hold and largely outcompetes and, along with predatory fish and birds, depredates the foothill yellow-legged frog, greatly decreasing their numbers.

### Northwestern Pond Turtle

The northwestern pond turtle (*Actinemys marmorata*) can be found throughout California and is the only abundant native turtle in California. They are associated with permanent or nearly permanent water in a wide variety of habitats at elevations ranging from near sea level to 4,700 feet. They require basking sites including partially submerged logs, rocks, mats of floating vegetation, or open mud banks. The northwestern pond turtle hibernates in colder areas underwater on muddy bottoms. Nesting sites are typically constructed along the banks of permanent water in soils at least 10 cm deep and must have high internal humidity for eggs to develop and hatch (Jennings and Hayes 1994).

Northwestern pond turtles are a known inhabitant of Butte Creek. Although there are no historical records of them occurring within the BSA. The closest known record of northwestern pond turtle was recorded in 2010, approximately 2.9 miles east in Comanche Creek within the City of Chico.

Although no northwestern pond turtles were observed during biological surveys, the BSA meets all their habitat parameters and it is possible they could occur within the BSA.

#### 4.6.5 *Birds*

Three special-status bird species, the bald eagle, the osprey and the yellow warbler, were all found to have at least moderate potential to occur within the BSA. Furthermore, additional migratory bird species protected by the Migratory Bird Treaty Act (MBTA) are known to occur within the BSA.

##### Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) is known to occur from Alaska to California and in California it is a permanent resident, now restricted to breeding mostly in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity Counties. Bald eagles are also found in a few favored inland waters in Southern California. They are more common at lower elevations, and are not found in the high Sierra Nevada. They require large bodies of water or free flowing rivers with abundant fish, and adjacent snags or other perches. Bald eagles will occasionally forage in flooded fields for displaced voles or other small mammals. They will also scavenge dead fish, water birds, and mammals, and have been known to steal from osprey. Typically, nests are within 1.6 km (1 mile) of water in large, old-growth, or dominant live trees with open branch work (less than 40% canopy). Nests are usually located 16-61 m (50-200 feet) above the ground. Breeding occurs from February to July; however, they don't begin nesting if human disturbance is evident. (USFWS 2018)

Bald eagles are well documented along Butte Creek. Although suitable foraging and nesting habitat occurs within the BSA, no bald eagles, or their large, conspicuous stick nests were observed.

##### Osprey

The osprey (*Pandion haliaetus*) is a migratory raptor species that feeds almost exclusively on live fish. Foraging in clear, open waters, ospreys dive feet first to catch their prey. This species is considered a Species of Special Concern by the CDFW, despite recent population increases following the elimination of pesticide use such as DDT, which caused population decline during the 1950s and up to 1970. Osprey populations appear to be increasing since the 1970s. Nests are constructed from sticks to form platforms on top of dead-topped trees, cliffs, man-made structures (i.e. cell phone and utility towers), and occasionally on the ground. Ospreys arrive on nesting grounds mid-March to early April and lay between 1-4 eggs. Southern migration occurs in October, with osprey flying along the coast and western slopes of Sierra Nevada in October to Central and South America (CDFG 2005).

Although the BSA offers suitable nesting and foraging habitat for osprey no osprey or their large, conspicuous sticks were observed during biological surveys.

##### Yellow Warbler

The yellow warbler (*Setophaga petechia*) is a summer resident found throughout California in riparian woodlands from coastal and desert lowlands up to 2500 meters in the Sierra Nevada Mountain Range. They can also be found in montane chaparral, open ponderosa pine forest and

mixed conifer habitats with substantial amounts of brush. They mainly eat insects and spiders and typically glean and hover in the upper canopy of deciduous trees and shrubs. The yellow warbler requires riparian deciduous habitats and montane habitats with tall trees for singing and foraging and a dense under story of shrubs for nesting. They are active diurnally and migrants typically arrive in California in April and remain until October. A small number of yellow warblers are known to over-winter in Southern California lowlands. Breeding occurs from mid-April into early August. The female will incubate the eggs for 11 days and once hatched, both parents will tend to the young until fledging at 9-12 days. In recent years, the numbers of breeding pairs have declined drastically in many lowland areas where they were formerly common. (Cornell Lab of Ornithology 1999)

Yellow warblers are an expected spring and fall migrant but typically breed at higher elevations in the Sierra Nevada mountains. They are not expected to be found breeding within the BSA as recent breeding records in the valley are nearly non-existent.

#### Migratory Bird Species

Migratory birds are protected in varying degrees under California Fish and Game Code, Section 3503.5, the MBTA, and CEQA. The project site currently provides suitable nesting and/or foraging habitat for a number of these species that may nest within the BSA. In addition to the riparian habitat the site also provides for nesting a small amount of barren and grassland habitats are available for ground nesting species, such as shorebirds, and others bird species protected by the MBTA. Species protected by the MBTA were observed within the BSA.

#### 4.6.6 *Mammals*

Four special-status mammals, the hoary bat, silver-haired bat, western red bat, and North American porcupine were all found to have the potential to occur within the BSA.

#### Hoary Bat

The hoary bat (*Lasiurus cinereus*) is the most widespread of the North American bats (Shump and Shump 1982). It is typically solitary, winters along the coast and in southern California, and breeds inland and north of the winter range. Suitable breeding habitats include all woodlands and forests with medium to large-sized trees and dense foliage at elevations ranging from sea level to 13,200 feet. The hoary bat primarily feeds on moths; however, their diet can be varied and include any number of flying insects (Black 1974). They prefer open habitats or habitat mosaics with access to water, trees with dense foliage for cover and breeding, and open areas or habitat edges for feeding and foraging (Shump and Shump 1982). Their spring migration northward occurs from February to May, with the females preceding the males, and fall migration occurs from September to November (Shump and Shump 1982).

The habitat within BSA meets all the roosting, breeding and foraging needs of hoary bats and there are known occurrences approximately 3.8 miles from the BSA. It is possible that hoary bats occur within the BSA.

#### North American Porcupine

The common porcupine is found throughout the Sierra Nevada and Cascades from Kern Co. north to the Oregon border, south in the Coast Ranges to Sonoma Co., and from San Mateo Co. south to

Los Angeles Co. Scattered populations occur in wooded habitats throughout the Central Valley (Laurendine et al. 1996), as well as Los Angeles and San Bernardino counties. Common to fairly common throughout its range, but populations tend to be localized. Most common in montane conifer, Douglas-fir, alpine dwarf-shrub, and wet meadow habitats. Less common in hardwood, hardwood-conifer, montane and valley-foothill riparian, aspen, pinyon-juniper, low sage, sagebrush, and bitterbrush. In spring and summer, porcupines feeds on aquatic and terrestrial herbs, shrubs, fruits, leaves, and buds. Winter diet consists of twigs, bark, and cambium of trees, particularly conifers, and evergreen leaves. Trees utilized include yellow pines, Douglas-fir, pinyon pine, lodgepole pine, western white pine, limber pine, bristle-cone pine, firs, oaks, maple, cottonwood, willow, and elderberry. Porcupines use caves, large rock crevices, hollow logs, trees for cover. (Taylor 1935, Woods 1973, Dodge 1982).

The habitat within the BSA cover, breeding and foraging needs of the North American porcupine and there is a record of the species within 500' of the BSA. It is possible that the North American porcupine occurs within the BSA.

#### Silver-Haired Bat

The silver-haired bat (*Lasionycteris noctivagans*) is a medium sized bat with black or brown fur, tipped with silver. Females form small colonies that roost almost exclusively in trees, inside natural hollows and bird excavated cavities or under loose bark of large diameter snags. It has been observed that both the male and female silver-haired bats use multiple roosts within a limited area, indicating that clusters of large trees are necessary for the roosting needs of these bats. Foraging of numerous insects species, especially moths, occurs above the canopy, over open meadows, and in the riparian zone along water courses. The silver-haired bat is primarily a forest bat, associated with northern temperate zone conifer and conifer/mixed hardwood forests; however, they have been found in lower elevation, more xeric (dry) conditions, during winter and seasonal migration. As all bats are vulnerable to disruption while in torpor (state of decreased metabolic activity, similar to hibernation) in their winter hibernacula, actions to prevent roosting within the project site should be initiated prior to the end of October, or begin construction activities in early spring (Western Bat Working Group 2007).

All the roosting, breeding and foraging needs of silver-haired bats are met within the BSA. The closest know occurrence is over 10 miles from the BSA, however bats are excellent dispersers and it is convenable that silver-haired bats could be found within the BSA.

#### Western Red Bat

The western red bat (*Lasiurus blossevillei*) is found in California from Shasta County to the Mexican border, west of the Sierra Nevada/Cascade crest and deserts. Winter range includes western lowlands and coastal habitats south of San Francisco. The western red bat roosts primarily in trees within forests and woodlands in edge habitats from sea level to mixed conifer forests (Williams and Findley 1979). However, the western red bat may have an association with riparian habitats with dense stands of cottonwood and sycamore, and orchards (Bolster, 1998). Family groups are known to roost together, forming nursing colonies. They forage in open areas and feed on a variety of insects including moths, crickets, beetles, and cicadas (Shump and Shump 1982). Migrations typically occur in the spring from March to May and in the autumn from September to October. The western red bat has been seen at temperatures as low as 44°F, however, in these cold climates the bat spends winter in hibernation (LaVal and LaVal 1979).



All the roosting, breeding and foraging needs of western red bats are met within the BSA. The closest known occurrence is over 10 miles from the BSA, however bats are excellent dispersers and it is conceivable that silver-haired bats could be found within the BSA.

#### **4.7 Waters of the United States**

A section of Butte Creek, a jurisdictional tributary Waters of the United States (WOTUS), falls within the USACE survey area which includes the BSA. Butte Creek is the only type of aquatic resources identified within the BSA and is distinguished under the *Classification of Wetlands and Deepwater Habitats of the United States* (1979) as Riverine Lower Perennial Streambed Cobble/Gravel (R-2-SB-3). Butte Creek is a tributary to the Sacramento River, a Traditionally Navigable Water (TNW) of the United States. Within the BSA, during typical flows, the creek is between approximately 50 and 100 feet in width and between two and six feet in depth. Butte Creek receives surface runoff from the surrounding landscape and as such is subject to flash high flow events associated with large storm events during the winter months.

#### **4.8 Previous Surveys**

CDFW began studying life history characteristics of spring-run Chinook salmon on Butte Creek in 1995. Today CDFW conducts a more thorough continuation of that initial study, involving estimating population of adults entering the system to spawn and trapping, measuring and estimating the number of juveniles emigrating from the creek. The CDFW fyke trap and fish ladder are located within the BSA (Garman, 2016). The fish traps located within the BSA are generally operational from October to early June when the fyke trap and rotary screw trap are removed during the summer months when water conditions in the BSA are unsuitable for salmonids.

In 2006 PG&E surveyed a 2.5 miles section, between 1.5 miles and 3.5 miles east of the intersection of Honey Run Road and Skyway, of Butte Creek which encompassed the BSA. Within their entire survey area they encountered two adults, 17 juveniles and 27 young-of-year. PG&E listed non-native animal impacts, specifically American bullfrogs, as a threat to the foothill yellow-legged frog within their survey area.

### **5. REGULATORY FRAMEWORK**

The following describes federal, state, and local environmental laws and policies that are relevant to the California Environmental Quality Act (CEQA) review process.

#### **5.1 Federal Regulations**

##### *5.1.1 Federal Endangered Species Act*

The United States Congress passed the federal ESA in 1973 to protect those species that are endangered or threatened with extinction. The ESA is intended to operate in conjunction with the National Environmental Policy Act (NEPA) to help protect the ecosystems upon which endangered and threatened species depend.

Under the ESA, species may be listed as “endangered”, “threatened.”, “candidate”, or “proposed” An endangered species is in danger of extinction throughout all or a significant portion of its range. A threatened species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. “Candidate” species are species for which there is enough information to warrant proposing them for listing, but that have not yet been proposed. “Proposed” species are those that have been proposed for listing, but have not yet been listed.

Section 9 of the ESA prohibits the “take” a listed animal without a permit. “Take” is defined to include harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting or any attempt to engage in any such conduct. “Harm” is defined as “an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.” Under Section 7 of the ESA, federal agencies are required to consult with the USFWS or National Marine Fisheries Service (NMFS) if their actions, including permit approvals or funding, could adversely affect an endangered plant or wildlife species or its habitat, or could adversely affect designated critical habitat. Through consultation and the issuance of a biological opinion, USFWS or NMFS can issue an incidental take statement allowing take of the species, provided the action will not jeopardize the continued existence of any federally listed species or result in the destruction or adverse modification of habitats of those species. Section 10 of the ESA provides for issuance of incidental take permits to private parties without a federal nexus provided a Habitat Conservation Plan (HCP) is developed.

#### *5.1.2 Migratory Bird Treaty Act Title 16 USC Section 703*

The federal Migratory Bird Treaty Act (MBTA) (16 USC §703) prohibits the killing of migratory birds or the destruction of their occupied nests and eggs except in accordance with regulations prescribed by the USFWS. The bird species covered by the MBTA includes nearly all of those that breed in North America, excluding introduced (i.e. exotic) species (50 Code of Federal Regulations §10.13).

#### *5.1.3 Clean Water Act Title 33 U.S.C. §1251*

##### ***5.1.3.1 Section 404 Clean Water Act***

The purpose of the Clean Water Act (CWA) is to “restore and maintain the chemical, physical, and biological integrity of the nation’s waters.” Section 404 of the CWA prohibits the discharge of dredged or fill materials into WOTUS without a permit from the United States Army Corps of Engineers (USACE). Additionally, Section 401 of the CWA (33 USC 1341) requires any applicant for a federal permit to conduct any activity that may result in the discharge of a pollutant into WOTUS, to obtain certification that the discharge will comply with the applicable water quality standards. A Water Quality Certification is required for Section 404 permit actions and they are issued by the Regional Water Quality Control Board (RWQCB).

For purposes of the Clean Water Act, 33 U.S.C. 1251 et seq. and its implementing regulations, the term “waters of the United States” means: (1) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (2) All interstate waters, including interstate wetlands;

(3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters: (i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or (ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (iii) Which are used or could be used for industrial purpose by industries in interstate commerce; (4) All Impoundments of waters otherwise defined as WOTUS under the definition; (5) Tributaries of waters identified in paragraphs (1) through (4) of this section; (6) The territorial seas; (7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (1) through (6) of this section.

The USACE may issue either individual permits on a case-by-case basis or general permits on a program level. General permits are pre-authorized and are issued to cover similar activities that are expected to cause only minimal adverse environmental effects. Nationwide permits are general permits issued to cover particular fill activities. All nationwide permits have general conditions that must be met for the permits to apply to a particular project, as well as specific conditions that apply to each nationwide permit.

## **5.2 State Regulations**

### **5.2.1 *California Endangered Species Act***

The California Endangered Species Act enacted in 1984, is similar to the federal ESA, but pertains to state-listed endangered and threatened species. The CESA requires state agencies to consult with the CDFW when preparing documents to comply with the CEQA. The purpose is to ensure that the actions of the lead agency do not jeopardize the continued existence of a listed species or result in the destruction, or adverse modification of habitat essential to the continued existence of those species. In addition to formal listing under the federal and state endangered species acts, “species of special concern” receive consideration by CDFW. Species of special concern are those whose numbers, reproductive success, or habitat may be threatened.

### **5.2.2 *California Fish and Game Code***

#### **5.2.2.1 *CFGF Section 3503 and 3503.5***

The California Fish and Game Code (CFGF) (§3503) states that “It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto.” “Take” includes the disturbance of an active nest resulting in the abandonment or loss of young.

Section §3503.5 of the CFGF states that it is “unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation pursuant thereto.”

#### **5.2.2.2 *CFGF Section 1600***

The CDFW is a trustee agency that has jurisdiction under the CFGF (§1600 et seq.). The California Fish and Game Code (§1602), requires that a state or local government agency, public utility, or

private entity must notify CDFW if a proposed project will “substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the department, or use any material from the streambeds... except when the department has been notified pursuant to §1601.” If an existing fish or wildlife resource may be substantially adversely affected by the activity, CDFW may propose reasonable measures that will allow protection of those resources. If these measures are agreeable to the parties involved, they may enter into an agreement with CDFW identifying the approved activities and associated mitigation measures.

### **5.2.2.3 CFGC Section 1900-1913**

The California Native Plant Protection Act (CFGC §1900-1913) prohibits the taking, possessing, or sale within the state of any plants with a state designation of rare, threatened, or endangered as defined by CDFW. An exception to this prohibition allows landowners, under specific circumstances, to take listed plant species, provided that the owners first notify CDFW and give the agency at least 10 days to retrieve (and presumably replant) the plants before they are destroyed. Fish and Game Code §1913 exempts from the “take” prohibition “the removal of endangered or rare native plants from a canal, lateral ditch, building site, or road, or other right of way.” Very few of the plants constituting List 3 and List 4 meet the definitions of §1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and few, if any, are eligible for state listing. Therefore, List 3 and List 4 plant species are not required to be considered in the preparation of environmental documents relating to CEQA unless they are considered locally or regionally significant.

The CNPS maintains a list of plant species native to California with low population numbers, limited distribution, or otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Vascular Plants of California (CNPS 2001). Potential impacts to populations of CNPS-listed plants receive consideration under CEQA review. The CNPS listings categorize plants as follows:

- List 1A: Plants presumed extinct in California;
- List 1B: Plants rare, threatened, or endangered in California or elsewhere;
- List 2: Plants rare, threatened, or endangered in California, but more numerous elsewhere;
- List 3: Plants about which we need more information; and
- List 4: Plants of limited distribution.

### **5.2.3 Public Resources Code**

#### **5.2.3.1 CEQA Guidelines Section 15380**

Although threatened and endangered species are protected by specific federal and state statutes, CEQA Guidelines §15380(d) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled based on the definition in the ESA and the section of the CFGC dealing with rare, threatened, and endangered plants and animals. The CEQA Guidelines (§15380) allows a public agency to undertake a review to determine if a significant effect on species that have not yet been listed by either the USFWS or CDFW (e.g. candidate

species, species of concern) would occur. Thus, CEQA provides a lead agency with the ability to protect a species from a project's potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

## **6. CONCLUSIONS AND RECOMMENDATIONS**

### **6.1 Worker Awareness Training**

Prior to any ground disturbing work, a qualified biologist should conduct worker awareness training for all the special-status species that could potentially occur on-site. The training should cover the legal status of each species, habitat requirements, representative photos, and avoidance and minimization measures to be implemented. Additionally, a description of activities that qualify as take of the species including harassment, destruction of habitat, and death of an individual should be discussed.

### **6.2 Valley Elderberry Longhorn Beetle**

The lone blue elderberry shrub is located approximately 415' from the nearest proposed project activities and consequently no negative impacts on the shrub or to potentially occurring VELB are anticipated as a result of the proposed project. The shrub will be clearly marked and a buffer will be established around the shrub to ensure that the proposed activities have no negative effects on the shrub.

### **6.3 Anadromous Fish including Spring Run Chinook salmon and Central Valley Steelhead**

To avoid the spring run salmon migration period through the BSA, which typically occurs between mid-February and mid-June, a work window of mid-August through early September should be adhered to. This work window is outside the known spawning season for all listed salmonids, therefore no spawning avoidance precautions are necessary. A rock berm will be left intact between the active channel of Butte Creek and the gravel extraction area to minimize potential siltation. Additionally, silt fence and/or other siltation barriers will be utilized to minimize potential siltation from entering the creek.

### **6.4 Foothill Yellow-legged Frog**

A preconstruction survey of the project area for foothill yellow-legged frog will be conducted by a qualified biologist no more than 14 days before the start of construction. If individuals are identified during the preconstruction survey, and on-site biological monitor will be present during all construction activities. If a foothill yellow-legged frog is observed in the project area during construction activities, project personnel will temporarily halt project activities until the frog has moved, under its own volition, to a safe location outside of the limits of the project area.

### **6.5 Northwestern Pond Turtle**

If a northwestern pond turtle is observed in the project area during construction activities, project personnel will temporarily halt project activities until the turtle has moved itself to a safe location outside the limits of the project area. If project activities are to occur during the nesting season,

(late June-July), a survey will be conducted by a qualified biologist to locate any northwestern pond turtles or their nests before project activities begin. This survey should be conducted no more than two days prior to the start of project activities. If a pond turtle nest is located, the biologist will flag the site and determine whether project activities can avoid affecting the nest. If the nest cannot be avoided, a no-disturbance buffer zone will be established around the nest in coordination with CDFW. The no-disturbance buffer will remain in place until the young have left the nest.

## **6.6 Birds including bald eagle, osprey and yellow warbler**

Vegetation removal or ground disturbance in areas where nests of birds protected by the MBTA (16 USC §703) and the CFGC (§3503) potentially occur, should be conducted between September 1 and February 28 (i.e. the non-breeding season). If vegetation removal or ground disturbance occurs during the breeding season (i.e. March 1 to August 31) then a qualified biologist shall:

1. Conduct a survey for raptors and all other birds protected by the MBTA and map all nests located within 250 feet of construction areas. The survey should be conducted no more than two weeks prior to the start of project activities.
2. If active nests are discovered, a qualified biologist shall establish buffer zones around active nests that are sufficient enough in size to ensure impacts to nesting species are avoided. Active nests shall be monitored at reasonable intervals, as determined by the qualified biologist. Project activities shall be prohibited within the buffer zones until the young have fledged or the nest fails, as determined by a qualified biologist. All construction personnel will be notified of the existence of the buffer zone and shall avoid entering the buffer zone during the nesting season.

## **6.7 Bats including hoary bay, silver-haired bat and western red bat**

It is anticipated that no vegetation removal will be necessary and therefore no monitoring or pre-construction bat surveys called for. In the event that vegetation removal is necessary, a pre-construction bat survey shall be conducted by a qualified biologist for the presence of any roosting bats on-site during the appropriate time of day to maximize detectability. The survey should be conducted within 14 days prior to commencement of vegetation removal activities. The survey methodology may include visual surveys of bats (e.g. observations of bats during foraging period), inspection of suitable habitat or signs of bat presence (e.g. guano, urine staining, vocalizations, etc.). The type of survey will depend on the condition of the potential roosting habitat.

Any vegetation that has been identified as potential roosting habitat must be removed between October 1 and February 28. If trees must be removed during the maternity roosting season (March 1 to September 30), a qualified biologist shall conduct a pre-construction survey to identify those trees proposed for disturbance that could provide hibernacula or nursery colony roosting habitat for bats. Trees identified as potentially supporting an active nursery shall be inspected by a qualified biologist no greater than 7 days prior to disturbance to determine presence or absence of roosting bats. Trees determined to support active maternity roosts will be left in place until the maternity season (September 30) or until the qualified biologist determines the bats are no longer present.

## **6.8 North American porcupine**

A preconstruction survey of the project area for North American porcupine will be conducted by NorthStar biologists no more than 14 days before the start of construction. In the case that a North American porcupine is observed in the project area during construction activities, project personnel will temporarily halt project activities until the porcupine has moved, under its own volition, to a safe location outside of the limits of the project area.

## **6.9 Waters of the United States**

A CWA Section 404 permit from the USACE and a CWA Section 401 Water Quality Certification from the RWQCB will need to be obtained prior to any construction activities.

- Work area boundaries will be flagged or fenced in order to prevent accidental impact to adjacent WOTUS.

## 7. REFERENCES

- Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken, editors. 2012. *The Jepson Manual: Vascular Plants of California, Second Edition*. University of California Press, Berkeley.
- Bolster, B.C., *Lasiurus blossevillei* Western Red Bat. Western Bat Working Group. <https://relicensing.pcwa.net/documents/Library/PCWA-L%20545.pdf>
- CDFG. 1998. Report to Fish and Game Commission: A Status Review of the Spring-run Chinook Salmon, (*Oncorhynchus tshawytscha*), in the Sacramento River Drainage, Candidate Species Status Report 98-01.
- CDFG. 1983. Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities. California Department of Fish and Game. Sacramento, CA. Revised May 2000.
- CNDDDB. 2019 California Department of Fish and Wildlife. Biogeographic Data Branch. California Natural Diversity Database. RareFind v. 5.1.1
- CNPS. Rare Plant Program. 2019. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website. <http://www.rareplants.cnps.org>
- CNPS Rare Plant Scientific Advisory Committee. February 1991 (Revised April 1998). Mitigation Guidelines Regarding Impacts to Rare, Threatened, and Endangered Plants. California Native Plant Society. Sacramento, CA.
- California Wildlife Habitats Relationships System. [http://www.dfg.ca.gov/biogeodata/cwhr/wildlife\\_habitats.asp](http://www.dfg.ca.gov/biogeodata/cwhr/wildlife_habitats.asp)
- Collinge, S.K., M. Holyoak, C.B. Barr, and J.T. Marty. 2001. Riparian habitat fragmentation and population persistence of the threatened valley elderberry longhorn beetle in Central California. *Biological Conservation* 100:103-113.
- Dodge, W. E. 1982. Porcupine. Pages 355-366 in J. A. Chapman and G. A. Feldamer, eds. *Wild Mammals of North America*. Johns Hopkins Univ. Press, Baltimore, MD. 1147pp.
- Fisher, F. W. 1994. Past and present status of Central Valley Chinook salmon. *Conservation Biology* 8:870-873.
- Garman, C.E. 2016. Butte Creek Juvenile Chinook Salmon Monitoring 20015-2016. State of California The Resources Agency Department of Fish and Wildlife.



- Hays, J.M., Arnold, G., Kimsey, B., Coleman, R., Gobler, E. and Meyer, F. 1977. Sacramento River king salmon, a dwindling natural resources. Calif. Dept. of Fish and Game, U.S. Fish and Wildlife Service, Bureau of Reclamation, Bureau of Land Management, Sacramento Valley Landowners Assoc., Regional Water Quality Control Board.
- Holland, R.F. 1986 Preliminary Descriptions of the Terrestrial Natural Communities of California. State of California, The Resources Agency, Nongame Heritage Program, Dept. of Fish and Game, Sacramento, CA
- Jennings, M. R. and M. P. Hayes. 1994. Amphibian and reptile species of special concern in California. California Department of Fish and Game. Rancho Cordova. 255 pp.
- Laurendine, W. E., M. L. Morton, and D. L. Chesemore. 1996. Occurrence of porcupines along the San Joaquin River, Fresno and Madera counties, California. Calif. Fish and Game 82:101-102.
- LaVal, R.K., and M.L. LaVal. 1979. "Notes on Reproduction, Behavior, and Abundance of the Red Bat, *Lasiurus borealis*." Journal of Mammalogy 60(1):209–212.
- Lowther, P.E., Celada, C., Klein, N.K., Rimmer, C.C. and Spector D.A. 1999. Yellow Warbler (*Setophaga petechia*). The Birds of North America Online. Ithaca. Cornell Lab of Ornithology.
- Mayer, K.E. and W.F. Laudenslayer. 1988. A Guide to Wildlife Habitats of California. California Department of Forestry and Fire Protection. Sacramento, CA.
- McEwan DR. 2001. Central Valley Steelhead. In: Contributions to the Biology of Central Valley Salmonids, Volume 1; RL Brown, ed. California Department of Fish and Game, Fish Bulletin 179. 43.
- McGurk, Bruce J. 1989. Introduction. In: Abell, Dana L., Technical Coordinator. 1989. Proceedings of the California Riparian Systems Conference: protection, management, and restoration for the 1990s; 1988 September 22-24; Davis, CA. Gen. Tech. Rep. PSW-GTR-110. Berkeley, CA: Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture; p. 155
- NRCS. 2006. Soil Survey of Butte Area, California, Parts of Butte and Plumas Counties. Natural Resources Conservation Service.
- Sawyer, J.O., Keeler-Wolf, T. and J.M. Evans. 2008. A Manual of California Vegetation. Second Edition. California Native Plant Society. Sacramento, CA.
- Shump, K.A., Jr., and A.U. Shump. 1982. "*Lasiurus cinereus*." American Society of Mammalogists. Mammalian Species 185:1–5.
- Skinner, M. and B. Pavlik. 2001. Inventory of rare and endangered vascular plants of California, 5<sup>th</sup> edition. California Native Plant Society. Sacramento, CA.

- Snyder, N. F. R. and J. W. Wiley. 1976. Sexual Size Dimorphism in Hawks and Owls of North America. Ornithological Monograph No. 20.
- Stebbins, R.C. 1985. A Field Guide to Western Reptiles and Amphibians. Second edition, revised. Houghton Mifflin Co. Boston, Massachusetts.
- Stebbins, Robert C., and McGinnis, Samuel M. Field Guide to Amphibians and Reptiles of California: Revised Edition (California Natural History Guides) University of California Press, 2012.
- Storer, Tracy I. *A Synopsis of the Amphibia of California*. University of California Press Berkeley, California 1925.
- Taylor, W. P. 1935. Ecology and life history of the porcupine (*Erethizon dorsatum*) as related to the forests of Arizona and the southwestern U.S. Univ. Ariz. Biol. Bull. 3:1-177.
- USACE. 2016. *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports*.
- USACE. 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation manual. Arid West Region* (Version 2.0).
- USACE. 2007. *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook*.
- USACE. 1987. *United States Army Corps of Engineers Wetlands Delineation Manual*.
- USFWS. 2019. Information for Planning and Consultation. Environmental Conservation Online System. Website <http://ecos.fws.gov/ipac>
- USFWS. 2018. Natural History, Ecology, and History of Recovery of the Bald Eagle. <https://www.fws.gov/midwest/eagle/recovery/biologue.html>
- USFWS. 1999. Conservation Guidelines for the Valley Elderberry Longhorn Beetle. USFWS, Sacramento, California.
- USFWS. 1991. The Distribution, Habitat, and Status of the Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*). USFWS, Sacramento, CA
- USFWS. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*.
- Western Bat Working Group. 2007. Western Bat Species: *Lasiurus noctivagans*. <http://wbwg.org/western-bat-species/>
- Williams, D. F., and J. S. Findley. 1979. Sexual and size dimorphism in vespertilionid bats. Am. Midl. Nat. 102:113-126.

Woods, C. A. 1973. *Erethizon dorsatum*. Mammal. Species No. 29. 6pp. in Sagehen Creek, California. J. Wildl. Manage. 25:221-242.

## **Appendix A**

### USFWS Species List

# IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

## Location

Butte County, California



## Local office

Sacramento Fish And Wildlife Office

☎ (916) 414-6600

🏢 (916) 414-6713

Federal Building  
2800 Cottage Way, Room W-2605  
Sacramento, CA 95825-1846

# Endangered species

**This resource list is for informational purposes only and does not constitute an analysis of project level impacts.**

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species<sup>1</sup> and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries<sup>2</sup>).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information.
2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

## Reptiles

NAME

STATUS

Giant Garter Snake *Thamnophis gigas*

Threatened

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/4482>

## Amphibians

NAME

STATUS

California Red-legged Frog *Rana draytonii*

Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.<https://ecos.fws.gov/ecp/species/2891>

## Fishes

NAME

STATUS

Delta Smelt *Hypomesus transpacificus*

Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.<https://ecos.fws.gov/ecp/species/321>

## Insects

NAME

STATUS

Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus*

Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.<https://ecos.fws.gov/ecp/species/7850>

## Crustaceans

NAME

STATUS

Conservancy Fairy Shrimp *Branchinecta conservatio*

Endangered

There is **final** critical habitat for this species. Your location is outside the critical habitat.<https://ecos.fws.gov/ecp/species/8246>Vernal Pool Fairy Shrimp *Branchinecta lynchi*

Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.<https://ecos.fws.gov/ecp/species/498>Vernal Pool Tadpole Shrimp *Lepidurus packardii*

Endangered

There is **final** critical habitat for this species. Your location is outside the critical habitat.<https://ecos.fws.gov/ecp/species/2246>

# Flowering Plants

NAME	STATUS
<b>Butte County Meadowfoam</b> <i>Limnanthes floccosa</i> ssp. <i>californica</i> There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat. <a href="https://ecos.fws.gov/ecp/species/4223">https://ecos.fws.gov/ecp/species/4223</a>	Endangered
<b>Greene's Tuctoria</b> <i>Tuctoria greenei</i> There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat. <a href="https://ecos.fws.gov/ecp/species/1573">https://ecos.fws.gov/ecp/species/1573</a>	Endangered
<b>Hairy Orcutt Grass</b> <i>Orcuttia pilosa</i> There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat. <a href="https://ecos.fws.gov/ecp/species/2262">https://ecos.fws.gov/ecp/species/2262</a>	Endangered
<b>Hoover's Spurge</b> <i>Chamaesyce hooveri</i> There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat. <a href="https://ecos.fws.gov/ecp/species/3019">https://ecos.fws.gov/ecp/species/3019</a>	Threatened

## Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

## Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:



- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

**Bald Eagle** *Haliaeetus leucocephalus*

Breeds Jan 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

<https://ecos.fws.gov/ecp/species/1626>

<b>Burrowing Owl</b> <i>Athene cunicularia</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA <a href="https://ecos.fws.gov/ecp/species/9737">https://ecos.fws.gov/ecp/species/9737</a>	Breeds Mar 15 to Aug 31
<b>California Thrasher</b> <i>Toxostoma redivivum</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Jul 31
<b>Common Yellowthroat</b> <i>Geothlypis trichas sinuosa</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA <a href="https://ecos.fws.gov/ecp/species/2084">https://ecos.fws.gov/ecp/species/2084</a>	Breeds May 20 to Jul 31
<b>Lewis's Woodpecker</b> <i>Melanerpes lewis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9408">https://ecos.fws.gov/ecp/species/9408</a>	Breeds Apr 20 to Sep 30
<b>Nuttall's Woodpecker</b> <i>Picoides nuttallii</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA <a href="https://ecos.fws.gov/ecp/species/9410">https://ecos.fws.gov/ecp/species/9410</a>	Breeds Apr 1 to Jul 20
<b>Oak Titmouse</b> <i>Baeolophus inornatus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9656">https://ecos.fws.gov/ecp/species/9656</a>	Breeds Mar 15 to Jul 15
<b>Rufous Hummingbird</b> <i>selasphorus rufus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/8002">https://ecos.fws.gov/ecp/species/8002</a>	Breeds elsewhere
<b>Song Sparrow</b> <i>Melospiza melodia</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Feb 20 to Sep 5
<b>Spotted Towhee</b> <i>Pipilo maculatus clementae</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA <a href="https://ecos.fws.gov/ecp/species/4243">https://ecos.fws.gov/ecp/species/4243</a>	Breeds Apr 15 to Jul 20
<b>Wrentit</b> <i>Chamaea fasciata</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 10

**Yellow-billed Magpie** *Pica nuttalli*

Breeds Apr 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9726>

## Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

### Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is  $0.25/0.25 = 1$ ; at week 20 it is  $0.05/0.25 = 0.2$ .
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

### Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

### Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

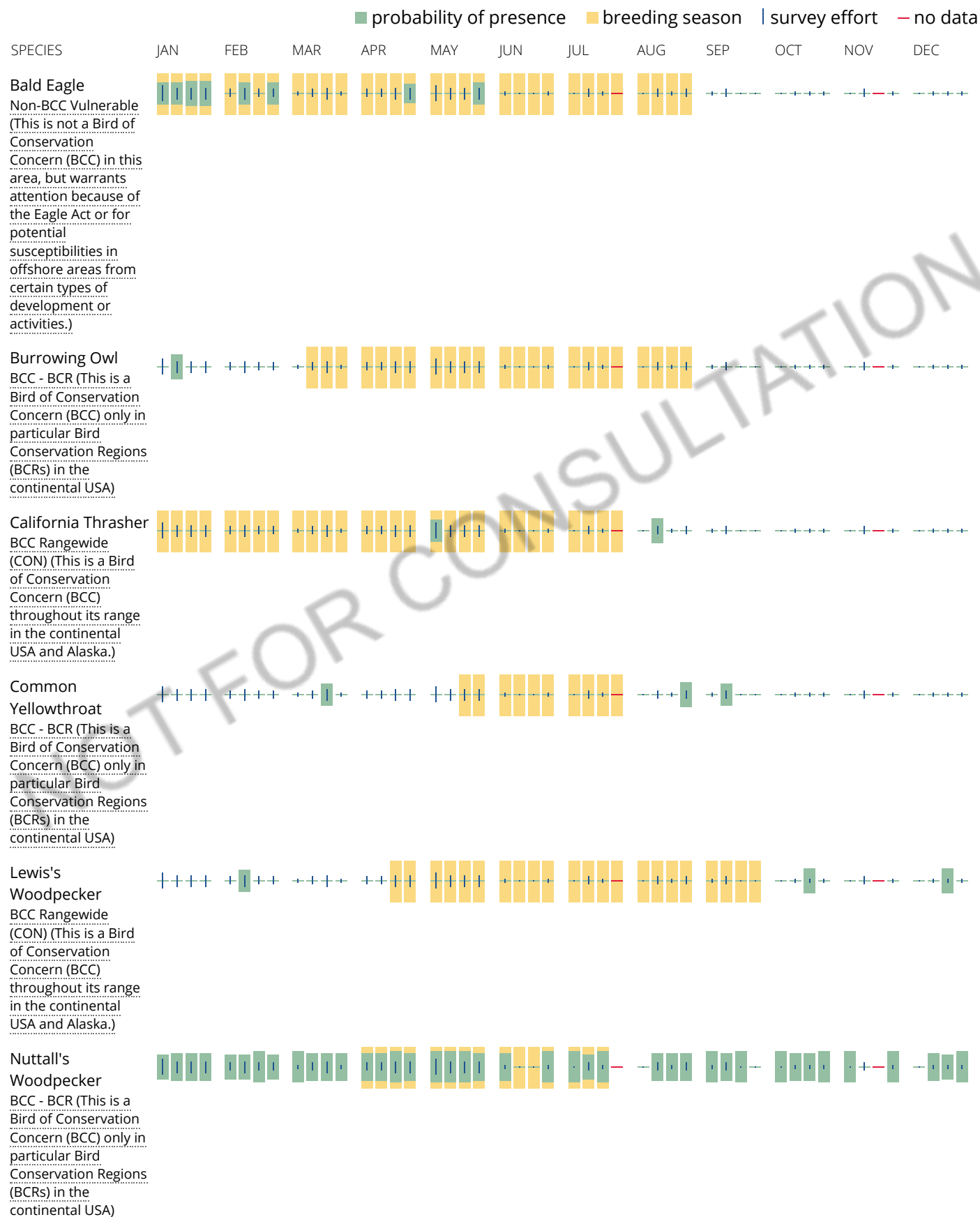
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

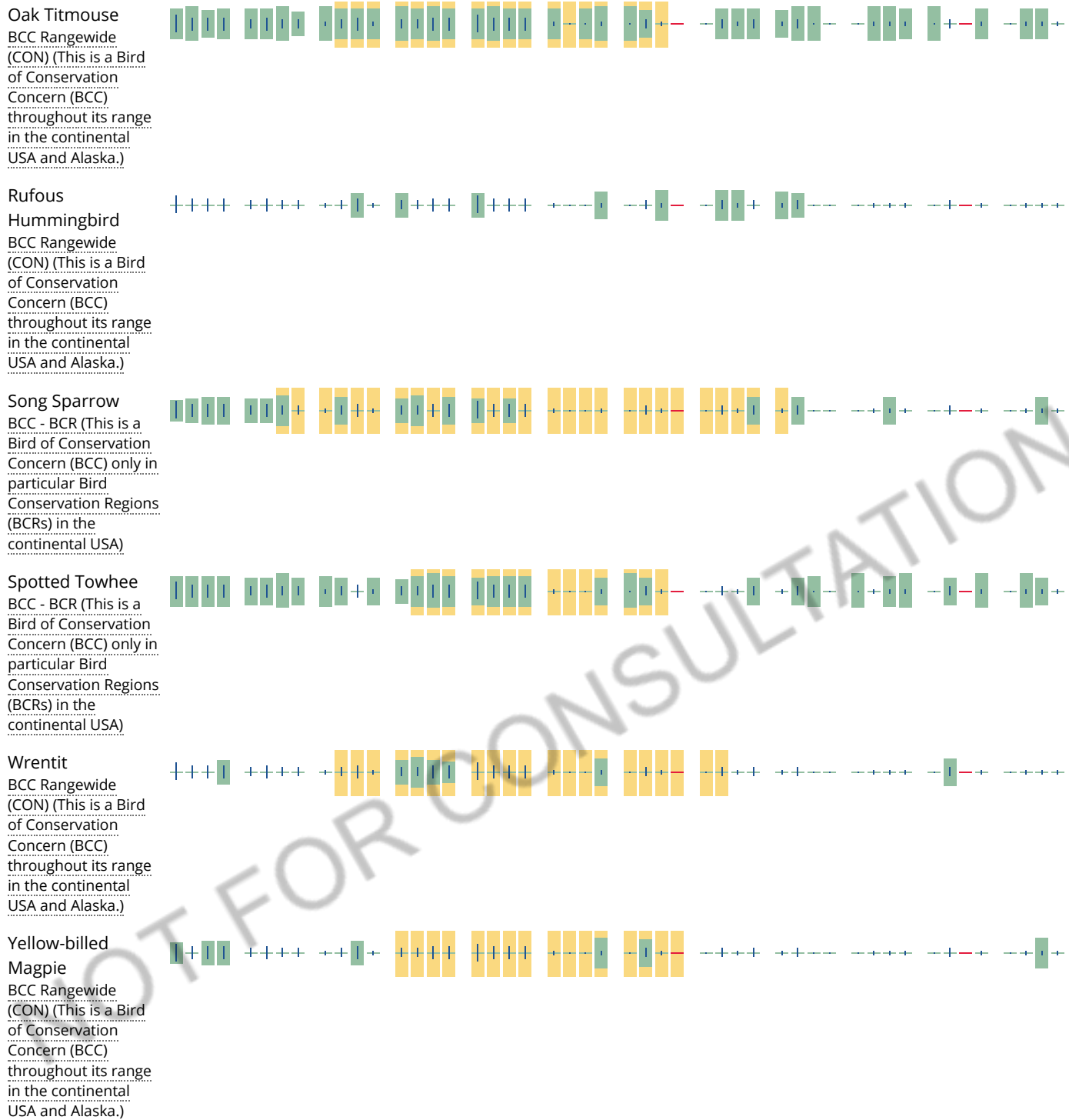
### No Data (—)

A week is marked as having no data if there were no survey events for that week.

## Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





**Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.**

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) and/or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

**What does IPaC use to generate the migratory birds potentially occurring in my specified location?**

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [E-bird Explore Data Tool](#).

### **What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?**

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

### **How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?**

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

### **What are the levels of concern for migratory birds?**

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

### **Details about birds that are potentially affected by offshore projects**

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review.



Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

### What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

### Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

## Facilities

### Wildlife refuges and fish hatcheries

REFUGE AND FISH HATCHERY INFORMATION IS NOT AVAILABLE AT THIS TIME

## Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER FORESTED/SHRUB WETLAND

[PFOA](#)

RIVERINE

[R3UBH](#)

[R5UBF](#)

[R5UBFx](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

#### Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

#### Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

#### Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.





## **Appendix B**

### **CNDDDB Species List**



# Selected Elements by Common Name

## California Department of Fish and Wildlife

### California Natural Diversity Database



**Query Criteria:** Quad<span style='color:Red'> IS </span>(Nord (3912178)<span style='color:Red'> OR </span>Richardson Springs (3912177)<span style='color:Red'> OR </span>Paradise West (3912176)<span style='color:Red'> OR </span>Ord Ferry (3912168)<span style='color:Red'> OR </span>Chico (3912167)<span style='color:Red'> OR </span>Hamlin Canyon (3912166)<span style='color:Red'> OR </span>Llano Seco (3912158)<span style='color:Red'> OR </span>Nelson (3912157)<span style='color:Red'> OR </span>Shippee (3912156))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<b>adobe-lily</b> <i>Fritillaria pluriflora</i>	PMLIL0V0F0	None	None	G2G3	S2S3	1B.2
<b>Ahart's buckwheat</b> <i>Eriogonum umbellatum</i> var. <i>ahartii</i>	PDPGN086UY	None	None	G5T3	S3	1B.2
<b>Ahart's paronychia</b> <i>Paronychia ahartii</i>	PDCAR0L0V0	None	None	G3	S3	1B.1
<b>American badger</b> <i>Taxidea taxus</i>	AMAJF04010	None	None	G5	S3	SSC
<b>American peregrine falcon</b> <i>Falco peregrinus anatum</i>	ABNKD06071	Delisted	Delisted	G4T4	S3S4	FP
<b>Antioch Dunes anthicid beetle</b> <i>Anthicus antiochensis</i>	IICOL49020	None	None	G1	S1	
<b>bald eagle</b> <i>Haliaeetus leucocephalus</i>	ABNKC10010	Delisted	Endangered	G5	S3	FP
<b>bank swallow</b> <i>Riparia riparia</i>	ABPAU08010	None	Threatened	G5	S2	
<b>big-scale balsamroot</b> <i>Balsamorhiza macrolepis</i>	PDAST11061	None	None	G2	S2	1B.2
<b>Brazilian watermeal</b> <i>Wolffia brasiliensis</i>	PMLEM03020	None	None	G5	S2	2B.3
<b>brownish beaked-rush</b> <i>Rhynchospora capitellata</i>	PMCYP0N080	None	None	G5	S1	2B.2
<b>burrowing owl</b> <i>Athene cunicularia</i>	ABNSB10010	None	None	G4	S3	SSC
<b>Butte County checkerbloom</b> <i>Sidalcea robusta</i>	PDMAL110P0	None	None	G2	S2	1B.2
<b>Butte County fritillary</b> <i>Fritillaria eastwoodiae</i>	PMLIL0V060	None	None	G3Q	S3	3.2
<b>Butte County golden clover</b> <i>Trifolium jokerstii</i>	PDFAB40310	None	None	G2	S2	1B.2
<b>Butte County meadowfoam</b> <i>Limnanthes floccosa</i> ssp. <i>californica</i>	PDLIM02042	Endangered	Endangered	G4T1	S1	1B.1
<b>Butte County morning-glory</b> <i>Calystegia atriplicifolia</i> ssp. <i>buttensis</i>	PDCON04012	None	None	G5T3	S3	4.2
<b>California beaked-rush</b> <i>Rhynchospora californica</i>	PMCYP0N060	None	None	G1	S1	1B.1
<b>California black rail</b> <i>Laterallus jamaicensis coturniculus</i>	ABNME03041	None	Threatened	G3G4T1	S1	FP



Selected Elements by Common Name  
California Department of Fish and Wildlife  
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<b>California linderiella</b> <i>Linderiella occidentalis</i>	ICBRA06010	None	None	G2G3	S2S3	
<b>California satintail</b> <i>Imperata brevifolia</i>	PMPOA3D020	None	None	G4	S3	2B.1
<b>chinook salmon - Central Valley spring-run ESU</b> <i>Oncorhynchus tshawytscha</i> pop. 6	AFCHA0205A	Threatened	Threatened	G5	S1	
<b>coast horned lizard</b> <i>Phrynosoma blainvillii</i>	ARACF12100	None	None	G3G4	S3S4	SSC
<b>Coastal and Valley Freshwater Marsh</b> <i>Coastal and Valley Freshwater Marsh</i>	CTT52410CA	None	None	G3	S2.1	
<b>Conservancy fairy shrimp</b> <i>Branchinecta conservatio</i>	ICBRA03010	Endangered	None	G2	S2	
<b>dissected-leaved toothwort</b> <i>Cardamine pachystigma</i> var. <i>dissectifolia</i>	PDBRA0K1B1	None	None	G3G5T2Q	S2	1B.2
<b>Ferris' milk-vetch</b> <i>Astragalus tener</i> var. <i>ferrisiae</i>	PDFAB0F8R3	None	None	G2T1	S1	1B.1
<b>flagella-like atractylocarpus</b> <i>Campylopodiella stenocarpa</i>	NBMUS84010	None	None	G5	S1?	2B.2
<b>foothill yellow-legged frog</b> <i>Rana boylei</i>	AAABH01050	None	Candidate Threatened	G3	S3	SSC
<b>giant gartersnake</b> <i>Thamnophis gigas</i>	ARADB36150	Threatened	Threatened	G2	S2	
<b>great blue heron</b> <i>Ardea herodias</i>	ABNGA04010	None	None	G5	S4	
<b>great egret</b> <i>Ardea alba</i>	ABNGA04040	None	None	G5	S4	
<b>Great Valley Cottonwood Riparian Forest</b> <i>Great Valley Cottonwood Riparian Forest</i>	CTT61410CA	None	None	G2	S2.1	
<b>Great Valley Mixed Riparian Forest</b> <i>Great Valley Mixed Riparian Forest</i>	CTT61420CA	None	None	G2	S2.2	
<b>Great Valley Valley Oak Riparian Forest</b> <i>Great Valley Valley Oak Riparian Forest</i>	CTT61430CA	None	None	G1	S1.1	
<b>Great Valley Willow Scrub</b> <i>Great Valley Willow Scrub</i>	CTT63410CA	None	None	G3	S3.2	
<b>Greene's tuctoria</b> <i>Tuctoria greenei</i>	PMPOA6N010	Endangered	Rare	G1	S1	1B.1
<b>hoary bat</b> <i>Lasiurus cinereus</i>	AMACC05030	None	None	G5	S4	
<b>Hoover's spurge</b> <i>Euphorbia hooveri</i>	PDEUP0D150	Threatened	None	G1	S1	1B.2
<b>least Bell's vireo</b> <i>Vireo bellii pusillus</i>	ABPBW01114	Endangered	Endangered	G5T2	S2	



# Selected Elements by Common Name

## California Department of Fish and Wildlife

### California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<b>loggerhead shrike</b> <i>Lanius ludovicianus</i>	ABPBR01030	None	None	G4	S4	SSC
<b>midvalley fairy shrimp</b> <i>Branchinecta mesovallensis</i>	ICBRA03150	None	None	G2	S2S3	
<b>North American porcupine</b> <i>Erethizon dorsatum</i>	AMAFJ01010	None	None	G5	S3	
<b>Northern Basalt Flow Vernal Pool</b> <i>Northern Basalt Flow Vernal Pool</i>	CTT44131CA	None	None	G3	S2.2	
<b>Northern Hardpan Vernal Pool</b> <i>Northern Hardpan Vernal Pool</i>	CTT44110CA	None	None	G3	S3.1	
<b>Northern Volcanic Mud Flow Vernal Pool</b> <i>Northern Volcanic Mud Flow Vernal Pool</i>	CTT44132CA	None	None	G1	S1.1	
<b>osprey</b> <i>Pandion haliaetus</i>	ABNKC01010	None	None	G5	S4	WL
<b>pallid bat</b> <i>Antrozous pallidus</i>	AMACC10010	None	None	G5	S3	SSC
<b>pink creamsacs</b> <i>Castilleja rubicundula</i> var. <i>rubicundula</i>	PDSCR0D482	None	None	G5T2	S2	1B.2
<b>recurved larkspur</b> <i>Delphinium recurvatum</i>	PDRAN0B1J0	None	None	G2?	S2?	1B.2
<b>Red Bluff dwarf rush</b> <i>Juncus leiospermus</i> var. <i>leiospermus</i>	PMJUN011L2	None	None	G2T2	S2	1B.1
<b>Sacramento anthicid beetle</b> <i>Anthicus sacramento</i>	IICOL49010	None	None	G1	S1	
<b>silky cryptantha</b> <i>Cryptantha crinita</i>	PDBOR0A0Q0	None	None	G2	S2	1B.2
<b>silver-haired bat</b> <i>Lasionycteris noctivagans</i>	AMACC02010	None	None	G5	S3S4	
<b>slender-leaved pondweed</b> <i>Stuckenia filiformis</i> ssp. <i>alpina</i>	PMPOT03091	None	None	G5T5	S2S3	2B.2
<b>steelhead - Central Valley DPS</b> <i>Oncorhynchus mykiss irideus</i> pop. 11	AFCHA0209K	Threatened	None	G5T2Q	S2	
<b>Swainson's hawk</b> <i>Buteo swainsoni</i>	ABNKC19070	None	Threatened	G5	S3	
<b>tricolored blackbird</b> <i>Agelaius tricolor</i>	ABPBXB0020	None	Candidate Endangered	G2G3	S1S2	SSC
<b>valley elderberry longhorn beetle</b> <i>Desmocerus californicus dimorphus</i>	IICOL48011	Threatened	None	G3T2	S2	
<b>veiny monardella</b> <i>Monardella venosa</i>	PDLAM18082	None	None	G1	S1	1B.1
<b>vernal pool fairy shrimp</b> <i>Branchinecta lynchi</i>	ICBRA03030	Threatened	None	G3	S3	



Selected Elements by Common Name  
California Department of Fish and Wildlife  
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<b>vernal pool tadpole shrimp</b> <i>Lepidurus packardii</i>	ICBRA10010	Endangered	None	G4	S3S4	
<b>watershield</b> <i>Brasenia schreberi</i>	PDCAB01010	None	None	G5	S3	2B.3
<b>western mastiff bat</b> <i>Eumops perotis californicus</i>	AMACD02011	None	None	G5T4	S3S4	SSC
<b>western pond turtle</b> <i>Emys marmorata</i>	ARAAD02030	None	None	G3G4	S3	SSC
<b>western red bat</b> <i>Lasiurus blossevillii</i>	AMACC05060	None	None	G5	S3	SSC
<b>western spadefoot</b> <i>Spea hammondi</i>	AAABF02020	None	None	G3	S3	SSC
<b>western yellow-billed cuckoo</b> <i>Coccyzus americanus occidentalis</i>	ABNRB02022	Threatened	Endangered	G5T2T3	S1	
<b>white-stemmed clarkia</b> <i>Clarkia gracilis ssp. albicaulis</i>	PDONA050J1	None	None	G5T3	S3	1B.2
<b>woolly meadowfoam</b> <i>Limnanthes floccosa ssp. floccosa</i>	PDLIM02043	None	None	G4T4	S3	4.2
<b>woolly rose-mallow</b> <i>Hibiscus lasiocarpus var. occidentalis</i>	PDMAL0H0R3	None	None	G5T3	S3	1B.2
<b>yellow warbler</b> <i>Setophaga petechia</i>	ABPBX03010	None	None	G5	S3S4	SSC
<b>Yuma myotis</b> <i>Myotis yumanensis</i>	AMACC01020	None	None	G5	S4	

Record Count: 73



## **Appendix C**

### **CNPS Species List**





## Plant List

### Inventory of Rare and Endangered Plants

40 matches found. [Click on scientific name for details](#)

#### Search Criteria

Found in Quads 3912178, 3912177, 3912176, 3912168, 3912167, 3912166, 3912158 3912157 and 3912156;

[Modify Search Criteria](#)
[Export to Excel](#)
[Modify Columns](#)
[Modify Sort](#)
[Display Photos](#)

Common Name	Scientific Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank
adobe navarretia	<a href="#">Navarretia nigelliformis ssp. nigelliformis</a>	Polemoniaceae	annual herb	Apr-Jun	4.2
adobe-lily	<a href="#">Fritillaria pluriflora</a>	Liliaceae	perennial bulbiferous herb	Feb-Apr	1B.2
Ahart's paronychia	<a href="#">Paronychia ahartii</a>	Caryophyllaceae	annual herb	Feb-Jun	1B.1
Bidwell's knotweed	<a href="#">Polygonum bidwelliae</a>	Polygonaceae	annual herb	Apr-Jul	4.3
big-scale balsamroot	<a href="#">Balsamorhiza macrolepis</a>	Asteraceae	perennial herb	Mar-Jun	1B.2
brassy bryum	<a href="#">Bryum chryseum</a>	Bryaceae	moss		4.3
Brazilian watermeal	<a href="#">Wolffia brasiliensis</a>	Araceae	perennial herb (aquatic)	Apr,Dec	2B.3
brownish beaked-rush	<a href="#">Rhynchospora capitellata</a>	Cyperaceae	perennial herb	Jul-Aug	2B.2
Butte County calycadenia	<a href="#">Calycadenia oppositifolia</a>	Asteraceae	annual herb	Apr-Jul	4.2
Butte County checkerbloom	<a href="#">Sidalcea robusta</a>	Malvaceae	perennial rhizomatous herb	Apr,Jun	1B.2
Butte County fritillary	<a href="#">Fritillaria eastwoodiae</a>	Liliaceae	perennial bulbiferous herb	Mar-Jun	3.2
Butte County golden clover	<a href="#">Trifolium jokerstii</a>	Fabaceae	annual herb	Mar-May	1B.2
Butte County meadowfoam	<a href="#">Limnanthes floccosa ssp. californica</a>	Limnanthaceae	annual herb	Mar-May	1B.1
Butte County morning-glory	<a href="#">Calystegia atriplicifolia ssp. buttensis</a>	Convolvulaceae	perennial rhizomatous herb	May-Jul	4.2
California beaked-rush	<a href="#">Rhynchospora californica</a>	Cyperaceae	perennial rhizomatous herb	May-Jul	1B.1
California satintail	<a href="#">Imperata brevifolia</a>	Poaceae	perennial rhizomatous herb	Sep-May	2B.1
depauperate milk-vetch	<a href="#">Astragalus pauperculus</a>	Fabaceae	annual herb	Mar-Jun	4.3
dissected-leaved toothwort	<a href="#">Cardamine pachystigma var. dissectifolia</a>	Brassicaceae	perennial rhizomatous herb	Feb-May	1B.2
Ferris' milk-vetch	<a href="#">Astragalus tener var. ferrisiae</a>	Fabaceae	annual herb	Apr-May	1B.1
flagella-like atractyllocarpus	<a href="#">Campylopodiella stenocarpa</a>	Dicranaceae	moss		2B.2
Greene's tuctoria	<a href="#">Tuctoria greenei</a>	Poaceae	annual herb	May-Jul(Sep)	1B.1

hairy Orcutt grass	<a href="#"><u>Orcuttia pilosa</u></a>	Poaceae	annual herb	May-Sep	1B.1
hogwallow starfish	<a href="#"><u>Hesperevax caulescens</u></a>	Asteraceae	annual herb	Mar-Jun	4.2
Hoover's spurge	<a href="#"><u>Euphorbia hooveri</u></a>	Euphorbiaceae	annual herb	Jul-Sep(Oct)	1B.2
Humboldt lily	<a href="#"><u>Lilium humboldtii ssp. humboldtii</u></a>	Liliaceae	perennial bulbiferous herb	May-Jul(Aug)	4.2
marsh claytonia	<a href="#"><u>Claytonia palustris</u></a>	Montiaceae	perennial herb	May-Oct	4.3
Mexican mosquito fern	<a href="#"><u>Azolla microphylla</u></a>	Azollaceae	annual / perennial herb	Aug	4.2
Parry's rough tarplant	<a href="#"><u>Centromadia parryi ssp. rudis</u></a>	Asteraceae	annual herb	May-Oct	4.2
pink creamsacs	<a href="#"><u>Castilleja rubicundula var. rubicundula</u></a>	Orobanchaceae	annual herb (hemiparasitic)	Apr-Jun	1B.2
recurved larkspur	<a href="#"><u>Delphinium recurvatum</u></a>	Ranunculaceae	perennial herb	Mar-Jun	1B.2
Red Bluff dwarf rush	<a href="#"><u>Juncus leiospermus var. leiospermus</u></a>	Juncaceae	annual herb	Mar-Jun	1B.1
shield-bracted monkeyflower	<a href="#"><u>Erythranthe glaucescens</u></a>	Phrymaceae	annual herb	Feb-Aug(Sep)	4.3
silky cryptantha	<a href="#"><u>Cryptantha crinita</u></a>	Boraginaceae	annual herb	Apr-May	1B.2
slender-leaved pondweed	<a href="#"><u>Stuckenia filiformis ssp. alpina</u></a>	Potamogetonaceae	perennial rhizomatous herb (aquatic)	May-Jul	2B.2
Tehama navarretia	<a href="#"><u>Navarretia heterandra</u></a>	Polemoniaceae	annual herb	Apr-Jun	4.3
veiny monardella	<a href="#"><u>Monardella venosa</u></a>	Lamiaceae	annual herb	May,Jul	1B.1
watershield	<a href="#"><u>Brasenia schreberi</u></a>	Cabombaceae	perennial rhizomatous herb (aquatic)	Jun-Sep	2B.3
white-stemmed clarkia	<a href="#"><u>Clarkia gracilis ssp. albicaulis</u></a>	Onagraceae	annual herb	May-Jul	1B.2
woolly meadowfoam	<a href="#"><u>Limnanthes floccosa ssp. floccosa</u></a>	Limnanthaceae	annual herb	Mar-May(Jun)	4.2
woolly rose-mallow	<a href="#"><u>Hibiscus lasiocarpus var. occidentalis</u></a>	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	1B.2

### Suggested Citation

California Native Plant Society, Rare Plant Program. 2018. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website <http://www.rareplants.cnps.org> [accessed 26 September 2018].

### Search the Inventory

[Simple Search](#)  
[Advanced Search](#)  
[Glossary](#)

### Information

[About the Inventory](#)  
[About the Rare Plant Program](#)  
[CNPS Home Page](#)  
[About CNPS](#)  
[Join CNPS](#)

### Contributors

[The Calflora Database](#)  
[The California Lichen Society](#)  
[California Natural Diversity Database](#)  
[The Jepson Flora Project](#)  
[The Consortium of California Herbaria](#)  
[CalPhotos](#)

### Questions and Comments

[rareplants@cnps.org](mailto:rareplants@cnps.org)



## Appendix D

Species Observed in the BSA by NorthStar Biologists.

Plants	
Scientific Name	Common Name
<i>Acer negundo</i>	Boxelder maple
<i>Ailanthus altissimas</i>	Tree of heaven
<i>Alnus rhombifolia</i>	White alder
<i>Artemisia douglasiana</i>	California mugwort
<i>Baccharis salicifolia</i>	Mule fat
<i>Brassica rapa</i>	Field mustard
<i>Centaurea solstitialis</i>	Yellow star thistle
<i>Elymus caput-medusae</i>	Medusa head
<i>Fraxinus latifolia</i>	Oregon ash
<i>Juglans hindsii</i>	Northern California black walnut
<i>Notholithocarpus densiflorus</i>	Tanoak
<i>Pinus sabiniana</i>	Gray pine
<i>Platanus racemose</i>	Western sycamore
<i>Populus fremontii</i>	Fremont's cottonwood
<i>Quercus lobate</i>	Valley oak
<i>Platanus racemosa</i>	Western sycamore
<i>Populus fremontii</i>	Fremont's cottonwood
<i>Quercus lobate</i>	Valley oak
<i>Quercus wislizeni</i>	Interior live oak
<i>Rubus armeniacus</i>	Himalayan blackberry
<i>Rubus ursinus</i>	California blackberry
<i>Rumex crispus</i>	Curly dock
<i>Salix exigua</i>	Sandbar willow
<i>Salix gooddingii</i>	Goodding's black willow
<i>Salix lasiolepis</i>	Arroyo willow
<i>Sambucus cerulea</i>	Blue elderberry
<i>Toxicodendron diversilobum</i>	Poison oak
<i>Vitis californica</i>	Californian grape
Wildlife	
Scientific Name	Common Name
<i>Aphelocoma californica</i>	California scrub-jay
<i>Baeolophus inornatus</i>	Oak titmouse
<i>Bombycilla cedrorum</i>	Cedar waxwing

<i>Calypte anna</i>	Anna's hummingbird
<i>Castor canadensis</i>	American beaver
<i>Cathartes aura</i>	Turkey vulture
<i>Catostomus occidentalis</i>	Sacramento sucker
<i>Charadrius vociferous</i>	Killdeer
<i>Haemorhous mexicanus</i>	House finch
<i>Lithobates catesbeianus</i>	American bullfrog
<i>Megaceryle alcyon</i>	Belted kingfisher
<i>Melospiza crissalis</i>	California towhee
<i>Mergus merganser</i>	Common merganser
<i>Mylopharodon conocephalus</i>	Hardhead
<i>Oncorhynchus mykiss</i>	Rainbow trout
<i>Oncorhynchus tshawytscha</i>	Chinook salmon
<i>Picoides nuttallii</i>	Nuttall's woodpecker
<i>Pipilo maculatus</i>	Spotted towhee
<i>Pseudacris sierra</i>	Sierra treefrog
<i>Ptychocheilus grandis</i>	Sacramento pikeminnow
<i>Sayornis nigricans</i>	Black phoebe
<i>Sceloporus occidentalis</i>	Western fence lizard
<i>Spinus psaltria</i>	Lesser goldfinch
<i>Spinus tristis</i>	American goldfinch
<i>Sturnus vulgaris</i>	European Starling
<i>Zonotrichia atricapilla</i>	Golden-crowned sparrow
<i>Zonotrichia leucophrys</i>	White-crowned sparrow

**Appendix D**  
**Draft Aquatic Resources Delineation**

---



**DRAFT**

**Aquatic Resources Delineation Report**

**Parrott-Phelan Restoration and Maintenance Project  
Butte County, California**

**August 2020**



*Prepared for:*

M&T Ranch  
3964 Chico River Road  
Chico, CA 95928

*Prepared by:*



111 Mission Ranch Blvd., Suite 100, Chico, CA 95926, Phone: 530.893.1600, Fax: 530.893.2113  
info@NorthStarEng.com | www.NorthStarEng.com



**Page Intentionally Left Blank.**

## **Executive Summary**

NorthStar conducted a delineation of aquatic resources classified as Waters of the United States (WOUS) as defined by the U.S. Army Corps of Engineers (USACE) for the M&T Ranch for the APNs 017-260-143 and 017-270-029. The delineation was conducted in accordance with *United States Army Corps of Engineers Wetlands Delineation Manual* (USACE 1987); the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008b); *A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States* (USACE 2008a); and the *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook* (USACE 2007).

This Aquatic Resources Delineation (ARD) report addresses the wetland diagnostic environmental characteristics of all potential aquatic features within the 11.5-acre USACE Survey Area (SA). It has been prepared in accordance with the *United States Army Corps of Engineers Minimum Standards for Acceptance of Aquatic Resources Delineation Reports* (USACE 2016a).

There are three proposed jurisdictional features identified totaling 4.27 acres of proposed Waters of the United States located within the SA. They are Butte Creek (PS-01), the diversion channel (PS-02), and a paleo overflow channel (IS-01). The following structures are also found within the SA: a weir, fish ladder, and associated fish screening project. All proposed impacts to the features are to be temporary in nature, although there will be a small area of permanent impact above the Ordinary High Water Mark on the southern bank of Butte Creek downstream of the weir structure to repair scour that occurred secondary to high water events in 2017 and 2018 (post Camp Fire). All proposed actions are to protect to the diversion, weir, and fish screening project as well as maintaining the historical alignment, and therefore flow, in the main channel of Butte Creek.

	Page
1. Introduction .....	1
1.1 Project Location.....	1
1.2 Project Description .....	1
2. Survey/Analysis Methodology.....	1
2.1 Wetland Feature Identification .....	6
2.2 Determination of Ordinary High Water Mark.....	7
3. Existing Site Conditions .....	10
3.1 General Site Hydrology.....	10
3.2 General Site Soils .....	10
3.2 Overall Site Vegetation Signature .....	11
4. Aquatic Resources Results .....	13
4.1 Jurisdictional Features (328.3(a)) .....	13
4.2 Non-Jurisdictional Waters (328.3(b)).....	15
5. References .....	17

<b>Tables</b>	<b>Page</b>
Table 1. Soil Map Units Occurring within the Parrott-Phelan Restoration Project Survey Area.....	15
Table 2. Post-Processed GPS Data Accuracies Parrott-Phelan Restoration and Maintenance Project Data.....	17
Table 3: Aquatic Resources Delineated within the USACE Survey Area.....	18
Table 4: Parrot-Phelan Field Data Sheet Results Summary.....	21

## **Appendices**

### Appendix A – Maps

*Figure 1-Location Map*

*Figure 2-Soil Map*

*Figure 3-Delineation of the Waters of the United States Map*

*Figure 4-National Wetlands Inventory Map*

### Appendix B – Site Photos

### Appendix C – USACE ORM Upload Sheet

### Appendix D – Terminology

### Appendix E – USDA Web Soil Survey Official Soils Series Description

### Appendix F – Field Data Forms

AFP	Active Floodplain
ARD	Aquatic Resources Delineation
CDFW	California Department of Fish and Wildlife
CWA	Clean Water Act
EPA	U.S. Environmental Protection Agency
GPS	Global Positioning System
HFU	Hydrogeomorphic Floodplain Unit
LFC	Low Flow Channel
LT	Low Terrace
msl	Mean Sea Level
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	Ordinary High-Water Mark
SA	Survey Area
Site	Project Site
TNW	Traditional Navigable Waters
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WOUS	Waters of the United States

# DRAFT

## Aquatic Resources Delineation Report

### Parrott-Phelan Restoration and Maintenance Project

#### Chico, Butte County, California

---

## 1. Introduction

NorthStar conducted a delineation of aquatic resources classified as Waters of the United States (WOUS) as defined by the U.S. Army Corps of Engineers (USACE) Assessor's Parcel Numbers (APN) 017-260-143 and APN 017-270-029. The APNs are located southeast of the City of Chico, on the southern side of Honey Run Road about 1.4 miles east from the intersection with Skyway Road. The APNs are both directly adjacent to Butte Creek, consisting of the bank and riparian habitat between Butte Creek and Honey Run Road, the USACE Survey Area (SA), as well this Aquatic Resources Delineation (ARD) address this entire area. (Appendix A – Figure 1).

This report has been prepared in accordance with *United States Army Corps of Engineers Minimum Standards for Acceptance of Aquatic Resources Delineation Reports* (USACE 2016a). It addresses the nature, jurisdictional status, and position of aquatic resources within the SA. This report does not provide information suitable for the structural analysis of soils for construction purposes, flood plain delineation, or other purposes not expressly stated. The WOUS acreages presented in this report should be considered preliminary, and subject to review and modification by the USACE during the aquatic resources verification process.

### 1.1 ***Project Location***

The SA is primarily undeveloped and comprised of Butte Creek, a perennial creek, and the surrounding foothill valley riparian habitat. There are no additional aquatic features within the SA. The SA is located in Section 34, Township 22 North, Range 02 East within the Hamlin Canyon United States Geological Survey (USGS) 7½ minute Quadrangle, in Butte County, California.

### 1.2 ***Project Description***

The proposed project involves the removal of annually deposited cobble/gravel, eventual erosion repair along the southern bank of Butte Creek, and erosion repairs at the existing weir.

#### *Gravel Removal*

Gravel removal will occur at two locations along the northern bank of Butte Creek, both up- and down- stream of the fish ladder. The upstream location will undergo annual removal while the downstream will only require removal efforts every 3-4 years.

1) TI02-AQ01 & TI02-UP01: The up-stream gravel removal will be conducted at an extraction area located upstream of the existing water diversion and fish ladder. As has occurred with historic

maintenance efforts, an excavator would be utilized to remove the accumulated gravel and place it in dump haul trucks where it will be removed from the project site. In the past the gravel had been placed downstream of the existing weir along the bank, so as to be reintroduced into the creek during high flow events. This however was not working, as the gravel would not mobilize as originally thought during high flow events. The gravel instead accumulated below the weir and caused excessive erosion to the southern bank of Butte Creek during the winter of 2016/2017. The gravel will no longer be placed below the existing weir, instead it will be hauled off-site to the Knife River Construction yard located approximately 1.75 miles from the project area at 1764 Skyway Road, Chico, CA 95928. A berm will be left intact between the active channel of Butte Creek and the gravel extraction area to minimize potential siltation and turbidity. Additionally, a silt curtain, silt fencing, straw wattle, and other siltation barriers will be utilized to minimize potential siltation from entering Butte Creek.

2) TI01-AQ01 & TI01-UP02: Utilizing a similar method to above, removal of the accumulated gravel downstream of the existing weir will be conducted every 3-4 years, so as to maintain fish ladder function and prevent scour and erosion across the bank. Gravel removal will maintain flow and access to the fish ladder as well as to expose and maintain function of the fyke outfall pipe. This will ensure that the structure remains unobstructed and functionally relevant so as to meet the needs of the fish screening program.

For both up- and downstream locations, accumulated gravel will be removed between August 15 to September 7 of each year to coincide with the lowest flow period within Butte Creek, and when listed salmonids will not potentially occur within the project area. The excavator will not enter the flowing water of Butte Creek and all equipment will be steam cleaned prior to beginning work. Equipment will be parked, fueled, and maintained outside of the stream zone and will access the site from Honey Run Road on the existing access road. No riparian vegetation will be removed, and temporary fencing will delineate access and haul routes. It is anticipated that gravel removal will take approximately two to three days to complete. Upon completion of the gravel removal any construction related best management practices including silt fencing would be removed from the extraction area.

The amount of sediment removed will vary year to year, primarily influenced by flows during the winter months. It is estimated the maximum total of excavated material would be approximately 6,250 cubic yards of material between the two areas. As stated earlier, gravel removal near the fyke outfall pipe may not be necessary every year while removal at the upstream location would be conducted each year. Approximately, 1,800 cubic yards of accumulated material was removed in 2018. The anticipated depth of excavation will be approximately three to six feet depending on the amount of deposited material. Gravel will be excavated back to an elevation of approximately 266 feet +/- 0.2' at the removal area located upstream of the existing diversion and to an elevation of approximately 256 feet +/- 0.2' downstream of the weir near the fyke outfall pipe.

### *Erosion Repair on Southern Downstream Bank*

PI01-UP03(CDFW only - above OHWM): Repair of the existing erosion on the southern bank of Butte Creek would be accomplished by the placement of fill material and rock slope protection (RSP) along the bank to protect against any future erosion. Backfill material would be placed followed by geotextile fabric and last, RSP to repair the eroded areas. The RSP would be keyed in properly to stabilize the eroded area. The RSP utilized has been selected to stand up to sheer stresses and water velocities encountered in this portion of the creek. It is anticipated the RSP utilized will be quarter ton with an approximate diameter of 24 inches and above.

TI05-AQ01: In order to repair erosion on the southern bank, downstream of the existing weir, a pad composed of clean gravel will be pushed into the creek and used to access the eroded area. A similar strategy has been utilized in another project along Butte Creek, the Aguas Frias Bridge Replacement Project, and is proposed to be used at the Midway Bridge Replacement Project. The pad will be sized as small as possible to facilitate work, and will be moved up- or downstream as needed depending on the extent of erosion repair. Most of the clean gravel utilized in constructing the pad will be removed upon completion of the erosion repair. The little clean gravel that would remain in Butte Creek after removal will benefit aquatic organisms including salmonids.

Equipment utilized would include but not be limited to an excavator and haul trucks.

### *Weir Repairs*

- 1) TI03-AQ01: A triangular shaped hole has established along the upstream facing side of the weir, adjacent to the upper portions of the fish ladder wingwall. The hole is approximately 30 feet in length along the face of the weir and approximately 10 feet wide along the wingwall of the fish ladder. It varies in depth from only a few inches deep to several feet where the weir meets the fish ladder. This hole is threatening to undermine the concrete apron of the weir that could cause significant and costly damage. As part of the project, the existing hole would be filled with approximately 20 cubic yards of rock to repair the erosion that has taken place.
- 2) TI04-AQ01: On the downstream southern corner of the weir, the structure is being undercut by erosion and a hole has formed and is enlarging. If the scour is allowed to continue unchecked, the integrity of the weir structure would be compromised. To prevent further deterioration of the weir, the hole will be filled with approximately 15 cubic yards of rock to repair the erosion that has taken place.

It is anticipated that between 200 pounds and a quarter ton of rocks will be used to fill each hole. Rocks are expected to range in diameter from approximately 16 inches and 24 inches. The site



would be accessed via the existing access roads at the diversion. Equipment utilized would include but not be limited to an excavator and haul trucks.

#### *Water Diversion*

Water diversion may be necessary for the erosion repair and the repair at the weir. During construction the weir will be raised, as it normally is during the summer months. Sandbags or large cubic yard material bags may be utilized to divert water either down the existing fish ladder or into the diversion where water would exit through the diversion pipe outfall located downstream of the existing weir. This would facilitate aquatic wildlife passage through the project area. An additional method that could be utilized is keeping a portion of the wetted channel open between the gravel pad and either bank edge to allow passage of aquatic wildlife while still facilitating equipment access. As previously mentioned, this method was utilized successfully at the Aguas Frias Bridge Replacement Project on Butte Creek downstream of the project site and is proposed for the Midway Bridge Replacement Project.

## 2. Survey/Analysis Methodology

Prior to conducting the on-site surveys, existing databases, topographic maps, soil reports, and multiple years of SA aerial imagery were reviewed and areas of potential WOUS were noted.

The SA was traversed on foot to locate and identify aquatic resources, capture photo documentation of areas observed, and to collect samples. NorthStar conducted the field delineation and prepared maps and acreage calculations secondary to data analysis.

Spatial data was obtained for all features and sample points during the delineation process using a Trimble GeoXH Global Positioning System (GPS) Receiver, which has sub-meter accuracy.

Several rounds of protocol level surveys at the site were conducted for the presence/absence of potential sensitive natural resources and to determine if these resources would be impacted by the proposed project. Site surveys were conducted on the following dates:

- March 7, 2018 by NorthStar biologists Matt Rogers and Andrew Huneycutt
- March 29, 2018 by NorthStar biologists Carol Wallen and Matt Rogers
- October 1, 2018 by NorthStar biologists Matt Rogers and Billy Abbott
- August 12, 2019 by NorthStar biologist Matt Rogers
- September 5, 2019 by NorthStar biologist Jake Sivertson
- January 7, 2020 by NorthStar biologists Carol Wallen, Andrew Huneycutt, Jake Sivertson, Billy Abbott, and NorthStar GIS Analyst/Surveyor Tim Alldrin.

These surveys involved an examination of botanical resources, hydrological features, soil characteristics, and the detailed analysis of potentially jurisdictional features based on the *United States Army Corps of Engineers Wetlands Delineation Manual* (USACE 1987); the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008b); *A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States* (USACE 2008a); and the *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook* (USACE 2007).

Many of the terms used throughout this report have specific meaning relating to the federal wetland delineation process. Term definitions are based on the *USACE Wetlands Delineation Manual* (USACE 1987), the *Federal Manual for identifying and Delineating Jurisdictional Wetlands* (USACE 1989), the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual Arid West Region* (USACE 2008), and the U.S. Fish and Wildlife Service (USFWS) *Classification of Wetlands and Deepwater Habitats of the U.S.* (USFWS 1979). Terms defined in (**Appendix A: Terminology**) have specific meaning relating to the delineation of WOUS as prescribed by Section 328.3 Definitions of Title 33, Chapter II, Part 328 of the Code of Federal Regulations. Not all terms identified in the above referenced manuals are included in **Appendix A**, only those applicable to this delineation.

### **2.1 Wetland Feature Identification**

The presence of water or saturated soil for approximately 5-12.5% of the growing season typically creates anaerobic conditions in the soil, and these conditions affect the types of plants that can grow and the types of soils that develop (Environmental Laboratory 1987).

Wetland presence or absence was determined using a combination of two steps: 1) Pre-survey aerial imagery investigation in multiple seasons to note areas of potential features; and 2) Secondary field surveys for ground truthing and identifying features. During field surveys, sample points are collected in upland/wetland pairs for any wetland features located with the SA. Additionally, pertinent negative samples are collected in areas that appeared to be a potential feature based on aerial imagery review, but which proved not to be features in the field.

Data at each point, if applicable, is recorded on a USACE Wetland Determination Data Form (WDDF) - Arid West Region (Version 2.0), in the appropriate locations. The WDDF documents wetland presence or absence through analysis of the vegetation, soil, and hydrology of each sample point. Typically, a feature must meet all three parameters to be considered a jurisdictional WOUS. There are exceptions to this, but they are generally less common and are human- or natural disaster-induced. If atypical situations are present on a site, either during the survey, or recent enough that their influence is evident on the expression of one of the three parameters, that information is also documented on the WDDF, and discussed further in the Results section.

#### **2.1.1 Determination of Hydrophytic Vegetation**

The presence of hydrophytic vegetation was determined using the methods outlined in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (USACE 1989) and the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Arid West Region* (USACE 2008), which are approved by the USACE for use in conjunction with the *Wetlands Delineation Manual* (USACE 1987). Plant species were identified to the lowest taxonomic level possible. The wetland indicator status of plants was determined using the *2016 National Wetland Plant List* and 2018 Update where applicable (USACE 2016/18). These plant values were then used to populate the Vegetation portion of the WDDF, thereby allowing completion of a Dominance Test and calculation of a Prevalence Index value; allowing for the determination of presence or absence of hydrophytic vegetation. Dominance tests shall be greater than 50% and the Prevalence Index score should be less than or equal to 3.0 for hydrophytic vegetation to be considered present.

#### **2.1.2 Determination of Hydric Soils**

Soil survey information for the SA and the NRCS Web Soil Survey (2020) was consulted on the local soil conditions. Official soil series descriptions are provided in **Appendix E**. As there were no wetland features present within the SA no soil samples were collected.

### *2.1.3 Determination of Hydrology*

Hydrology was determined to be present if a feature supported one or more of the following characteristics:

- Landscape position and surface topography (e.g. position of the site relative to an up-slope water source, location within a distinct wetland drainage pattern, or concave topography);
- Inundation or saturation for a long duration either inferred based on field indicators or observed during repeated site visits and by examining past and current aerial imagery; and
- Residual evidence of ponding or flooding resulting in field indicators such as scour marks, sediment deposits algal matting, and/or drift lines.

The presence of water or saturated soil for approximately 5-12.5% of the growing season typically creates anaerobic conditions in the soil, and these conditions affect the types of plants that can grow and the types of soils that develop (Environmental Laboratory 1987). The National Wetlands Inventory (NWI) Mapper was consulted, a copy of the NWI map of the SA may be found in **Appendix A - Figure 4**.

## **2.2 Determination of Ordinary High Water Mark**

For other waters (non-wetland and non-tidal features), the ordinary high water mark (OHWM) is determined using the guidelines in the 2008 USACE *Arid West OHWM Field Guide* mentioned above and recorded feature data is populated on the 2010 USACE *Updated Datasheet for the Identification of the OHWM in the Arid West Region of the Western United States* (OHWMDS). The lateral extent of USACE jurisdiction non-tidal water bodies (e.g. intermittent streams, creeks, rivers) are based on the OHWM, which is “the line on the shore established by the fluctuations of water” (USACE 2005). The OHWM is determined using the presence of key physical indicators including scour, multiple observed flow events (from current and historical aerial photos and stream gage data), shelving, changes in the character of soil, presence of mature vegetation, deposition, and topography. If present, representative cross sectional transects are taken at all features where OHWM indicators are present; with an additional transect being taken at each change in character along the feature channel. At each transect location, the following hydrogeomorphic floodplain unit (HFU) locations are recorded with the GPS unit: 1) Low flow channel (LFC), 2) OHWM, 3) Active Flood Plain (AFP), and 4) Low terrace (LT). The characteristics of each HFU in terms of sediment texture, vegetation cover, and community succession are recorded on the OHWMDS for each respective transect. Any indicators present (i.e. mud cracks, benching, drift and debris) are also recorded on the OHWMDS. Field data forms can be found in **Appendix XX**.

### **2.3 Determination of Potential Jurisdiction**

On June 29, 2015, the EPA and USACE published the 2015 Clean Water Rule (CWR) in an effort to better define the scope of waters protected under the CWA, which was set to go into effect on August 28, 2015. However, CA was one of 13 states that sued to block the regulation in-state, thereby generating a stay placed on the rule by the U.S. Court of Appeals for the Sixth Circuit on October 9, 2015. The 2015 CWR stay was rescinded on February 28, 2017, with the signing of Executive Order 13778; which essentially instructed the EPA and USACE to 1) review the 2015 rule for consistency with the objectives of the executive order (i.e. “to increase CWA program predictability and consistency by increasing clarity as to the scope of “waters of the United States” federally regulated under the Act.”) and 2) “to issue a proposed rule rescinding or revising the 2015 Rule as appropriate and consistent with law.” The agencies issued a final rule, 83 FR 5200 (Feb. 6, 2018), adding an applicability date to the 2015 Rule, which resulted in several district court challenges. The U.S. District Court for the District of South Carolina granted summary judgment in favor of the plaintiffs and enjoined the Applicability Date Rule nationwide. On November 26, 2018, the U.S. District Court for the Western District of Washington vacated the Applicability Date Rule nationwide; resulting in the 2015 Rule coming into effect in 22 States, including CA. On September 12, 2019, the EPA and USACE signed for publication in the Federal Register, a final rule to repeal the 2015 CWR. This publication, titled “Definition of “Waters of the United States” - Recodification of Pre-Existing Rules”.

The EPA and USACE published the Navigable Waters Protection Rule in the Federal Register on April 21, 2020, which served to finalize a revised definition of “waters of the United States” under the CWA. According to the EPA, “Congress, in the Clean Water Act, explicitly directed the Agencies to protect “navigable waters.” The Navigable Waters Protection Rule regulates the nation’s navigable waters and the core tributary systems that provide perennial or intermittent flow into them.” This final rule became effective on June 22, 2020 and now provides the currently accepted definitions for what feature types qualify as WOUS. Though there are pending litigations to the current definitions of WOUS, this Aquatic Resources Delineation Report was prepared in accordance with the guidance, relevant case law, and applicable policy at the time of its drafting.

According to the current § 328.3 definitions, we utilized the following definitions:

*(a) Jurisdictional waters. For purposes of the Clean Water Act, 33 U.S.C. 1251 et seq. and its implementing regulations, subject to the exclusions in paragraph (b) of this section, the term “waters of the United States” means:*

*(1) The territorial seas, and waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including waters which are subject to the ebb and flow of the tide;*

*(2) Tributaries;*

*(3) Lakes and ponds, and impoundments of jurisdictional waters; and*

*(4) Adjacent wetlands.*

*(b) Non-jurisdictional waters. The following are not “waters of the United States”:*

*(1) Waters or water features that are not identified in paragraphs (a)(1)-(4) above*

*(2) Groundwater, including groundwater drained through subsurface drainage systems;*

*(3) Ephemeral features, including ephemeral streams, swales, gullies, rills, and pools;*

*(4) Diffuse stormwater run-off and directional sheet flow over upland;*

*(5) Ditches that are not waters identified in paragraph (a)(1) or (2) of this section, and those portions of ditches constructed in waters identified in paragraph (a)(4) in the above section that do not satisfy the conditions of paragraph (c)(1) of 328.3;*

*(6) Prior converted cropland;*

*(7) Artificially irrigated areas, including fields flooded for agricultural production, that would revert to upland should application of irrigation water to that area cease;*

*(8) Artificial lakes and ponds, including water storage reservoirs and farm, irrigation, stock watering, and log cleaning ponds, constructed or excavated in upland or in non-jurisdictional waters, so long as those artificial lakes and ponds are not impoundments of jurisdictional waters that meet the conditions of paragraph (c)(6) of this section;*

*(9) Water-filled depressions constructed or excavated in upland or in non-jurisdictional waters incidental to mining or construction activity, and pits excavated in upland or in non-jurisdictional waters for the purpose of obtaining fill, sand, or gravel;*

*(10) Stormwater control features constructed or excavated in upland or in non-jurisdictional waters to convey, treat, infiltrate, or store stormwater run-off;*

*(11) Groundwater recharge, water reuse, and wastewater recycling structures, including detention, retention, and infiltration basins and ponds, constructed or excavated in upland or in non-jurisdictional waters; and*

*(12) Waste treatment systems*

### 3. Existing Site Conditions

The approximate 11.5-acre SA is undeveloped and comprised primarily of annual grassland with a few scattered Fremont cottonwood trees and California grape, mostly along the channel edges (**Attachment B: Site Photos**). The SA is dominated by a Mediterranean climate, with a mean annual temperature of approximately 61°F and mean annual precipitation of approximately 25 inches (WRCC 2019).

The SA contains an approximate 557-foot section of DHS, and contains no additional aquatic features. Topography within the SA is gently sloping with elevation ranging from 292 to 335 feet above mean sea level (msl). The area to the north has been and/or is being developed as part of the Oak Valley subdivision, while the area to the south remains undeveloped.

#### 3.1 **General Site Hydrology**

The hydrologic regime within the SA is predominately driven by seasonal precipitation, which occurs primarily between November and March. This is common within the landscapes of California's Central Valley. The lone aquatic feature, DHS, conveys water east to west through the SA. The National Wetland Inventory (NWI) Mapper was consulted, an NWI map of the SA is found in **Appendix B: NWI Map**. Within the SA, during typical flows, the creek is between approximately 50 and 100 feet in width and between two and six feet in depth. Butte Creek receives surface runoff from the surrounding landscape and as such is subject to flash high flow events associated with large storm events during the winter months.

#### 3.2 **General Site Soils**

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey and the 2006 *Soil Survey of Butte Area, Parts of Butte and Plumas Counties, California* identified a single soil map unit within the SA (**Appendix A – Figure 2**). The site is completely comprised of Xerorthents, Tailings and 0 to 50 percent slopes (**Table 1**). Xerorthents, Tailings and 0 to 50 percent slopes is derived from dredged spoil piles from gravelly alluvium from igneous, metamorphic and sedimentary rock. Xerorthents, Tailings and 0 to 50 percent slopes is somewhat excessively drained and is of the very low runoff class. Completion of the OHWM datasheets for all aquatic features within project boundaries included the recording of soil type for each HFU. Field data sheets can be found in **Appendix B**.

**Table 1. Soil Map Units Occurring within the Parrott-Phelan Restoration Project Survey Area.**

Butte Area, Parts of Butte and Plumas Counties, California (CA612)			
Map Unit	Map Unit Name	Acres in Area of Interest	Percent of Area of Interest
118	Xerorthents, Tailings and 0 to 50 percent slopes	12.3	100.00%
Totals for Area of Interest		12.3	100.00%

### **3.2 Overall Site Vegetation Signature**

Vegetation within the SA is dominated by a mix of native and non-native riparian vegetation and some grasses, including; boxelder maple (*Acer negundo*), tree of heaven (*Ailanthus altissima*), white alder (*Alnus rhombifolia*), California mugwort (*Artemisia douglasiana*) mule fat (*Baccharis salicifolia*), field mustard (*Brassica rapa*), yellow star thistle (*Centaurea solstitialis*), medusa head (*Elymus caput-medusae*), Oregon ash (*Fraxinus latifolia*), northern California black walnut (*Juglans hindsii*), tanoak (*Notholithocarpus densiflorus*), gray pine (*Pinus sabiniana*), western sycamore (*Platanus racemose*), Fremont's cottonwood (*Populus fremontii*), valley oak (*Quercus lobata*), interior live oak (*Quercus wislizeni*), Himalayan blackberry (*Rubus armeniacus*), California blackberry (*Rubus ursinus*), curly dock (*Rumex crispus*), sandbar willow (*Salix exigua*), Goodding's black willow (*Salix gooddingii*), arroyo willow (*Salix lasiolepis*), blue elderberry (*Sambucus cerulea*), poison oak (*Toxicodendron diversilobum*), and California grape (*Vitis californica*).

The following vegetation communities were identified on-site using A Manual of California Vegetation - Second Edition (Sawyer, Keeler-Wolf, and Evans, 2009) and further described using the California Wildlife Habitat Relationships (CWHR) based on classifications created by Mayer and Laudenslayer (1998). The CWHR system was designed to aid in the mapping of habitats utilized by California's commonly occurring birds, mammals, reptiles, and amphibians.

#### **3.2.1 Annual Grassland**

Annual grassland habitats can be found throughout California and are found on flat plains to gently rolling foothills and often occur in between or adjacent to other wooded habitat types. Annual grasslands are described as open grasslands composed primarily of annual plant species and often consist of a variety of introduced invasive species. Species composition is strongly influenced by abiotic factors and compositional changes fluctuate seasonally due to the phenology of plants found within an area. Species commonly found within annual grasslands include wild oats (*Avena fatua*), ripgut brome (*Bromis diandrus*), red brome (*Bromus madritensis*), soft chess (*Bromus hordeaceus*), wild barely (*Hordeum* spp.), foxtail fescue (*Vulpia myuros*), filaree (*Erodium* spp.), and various clovers (*Trifolium* spp.), among others.

A number of wildlife species use annual grasslands for breeding and foraging. Species encountered during surveys included western fence lizard (*Sceloporus occidentalis*), lesser goldfinch (*Spinus psaltria*), American goldfinch (*Spinus tristis*) white-crowned sparrow (*Zonotrichia leucophrys*).

#### **3.2.2 Valley Foothill Riparian**

Valley foothill riparian habitat generally is found in association with riverine systems in California. Structurally, valley foothill riparian habitats are quite diverse, containing distinct vegetation layers. Valley foothill riparian canopy within the SA contains a mix of Fremont cottonwood



(*Populus fremontii*), western sycamore (*Platanus racemosa*), Goodding's black willow (*Salix gooddingii*), and valley oak (*Quercus lobate*) with a canopy cover of 20 to 80 percent. The subcanopy includes arroyo willow (*Salix lasiolepis*), sandbar willow (*Salix exigua*), and white alder (*Alnus rhombifolia*). In addition to a subcanopy, a vine understory is present, which includes Himalayan blackberry (*Rubus armeniacus*), California grape (*Vitis californica*), poison oak (*Toxicodendron diversilobum*), and interspersed various shade tolerant grasses.

The diversity of vegetative structure within valley foothill riparian habitats provides food, water, nesting, dispersal habitat, and shelter for a number of species, especially birds protected by the Migratory Bird Treaty Act. Species observed during surveys include black phoebe (*Sayornis nigricans*), belted kingfisher (*Megaceryle alcyon*), spotted towhee (*Pipilo maculatus*), oak titmouse (*Baeolophus inornatus*) and cedar waxing (*Bombycilla cedrorum*).

### 3.2.3 Riverine

Riverine habitat is defined as a major intermittent or perennial stream and the inclusive habitats surrounding the channel edges. Butte Creek originates at roughly 4,800' in the Butte Meadows/Jonesville Basin, approximately 28 miles, northeast of the SA. Butte Creek is a perennial stream with year-round flow. During the dry season flows are decreased, during the rainy season however, Butte Creek is subject to large spikes in flows, as surface runoff during storms drains into the creek. The flow spikes are generally short lived but are responsible for much of the erosion, sediment transfer and bank undercutting that occurs on Butte Creek.

Riverine habitats provide support a number of species, providing foraging and breeding habitat as well as cover for a number of species. During surveys some of the observed species include Chinook salmon (*Oncorhynchus tshawytscha*), Sacramento pikeminnow (*Ptychocheilus grandis*) rainbow trout (*Oncorhynchus mykiss*) and common merganser (*Mergus merganser*).

### 3.2.4 Barren

Barren habitat is characterized by a lack of vegetation. Any habitat with less than two percent total vegetation cover by herbaceous, desert, or non-wildland species and less than 10 percent cover by tree or shrub species is defined as barren. Structure and composition of the substrate is extremely variable and determined by several factors, including region, surrounding environment, disturbance levels, etc. Within the SA the barren habitat includes the two managed gravel bars and the area of shotcrete and RSP around the weir.

Barren habitats are not completely devoid of wildlife, a number of species will use barren areas to roost, nest, and forage. Instead of the vegetative structure being an important component of the habitat, the structure of the substrate becomes critical. During surveys killdeer (*Charadrius vociferous*) and western fence lizard (*Sceloporus occidentalis*) were observed.

## 4. Aquatic Resources Results

This section summarizes the results of the Aquatic Resources Delineation for the SA and identifies all aquatic features and their proposed jurisdictional status, as well as their identifiers (i.e. soils, vegetation, and hydrology, or hydrogeomorphic indicators, as applicable).

As stated previously, all proposed feature boundaries and sample points were collected using Trimble handheld GPS units. The maximum position dilution of precision (PDOP) during data collection was 7.5. No readings were taken with fewer than five satellites. Point data location were recorded for 60 seconds at a rate of one position per second. Area and line data were recorded at a rate of one position per second while walking at a slow pace. All GPS data was differentially corrected for a maximum accuracy using University Navigation Satellite Timing and Ranging System (NAVSTAR) Consortium (UNAVCO) Reference Station (Corning, CA (p344)). **Table 2** depicts the accuracy ranges of the post-differential correction data for all positions collected on-site (expressed as accuracy range/percentage of data in range) using handheld units.

**Table 2. Post-Processed GPS Data Accuracies Parrott-Phelan Restoration and Maintenance Project Data.**

Data Set Year/Range	5-15 cm	15-30 cm	30-50 cm	0.5-1 m	1-2 m
7 January 2020	n/a	14.16	69.65	16.18	n/a
7 January 2020	n/a	15.48	63.32	19.9	0.5

The GPS data above has been mapped using ArcGIS per USACE standards set forth in the *Updated Map and Drawing Standards for the South Pacific Division Regulatory Program* (USACE 2016b) and may be found in **Attachment A: Figure 3 - Delineation of WOUS Map**. The SA contains one feature that is potentially a jurisdictional WOUS. This feature is anticipated to be impacted by project activities.

### 4.1 Jurisdictional Features (328.3(a))

An approximate 13.92-acre section of Butte Creek is jurisdictional (a)(2) Tributary WOUS, as it is a tributary to the Sacramento River, a Traditionally Navigable Water (TNW). It falls within the USACE SA. Butte Creek, a perennial stream, is the only type of aquatic resource identified within the SA and is distinguished under the *Classification of Wetlands and Deepwater Habitats of the United States* (1979) as Riverine Lower Perennial Streambed Cobble/Gravel (R-2-SB-3). The feature is mapped at a 1" to 150' scale, with zoomed inset maps of the cross-sections (**Attachment A: Figure 3**).

No TNW or wetland features were identified within the SA.

The WOUS acreages presented in this report should be considered preliminary, and subject to review and modification by the USACE during the aquatic resources delineation verification process, if once becomes required. The features analyzed within the SA and the interpretation of the data used to delineate their jurisdictional boundaries are described below. **Table 3** below

provides a summary of the potentially jurisdictional aquatic feature identified within the SA. The data was transferred into and may also be found in **Attachment C: USACE ORM Upload Sheet**.

**Table 3: Aquatic Resources Delineated within the USACE Survey Area.**

PROPOSED WATERS OF THE UNITED STATES (WOUS)					
Type	Description	Class*	Label	Area (ft²)	Area (ac)
Other Waters of the United States					
(a)(2)	Perennial Creek	R-3-UB-1	PS-01	173,206.277640	3.976269
(a)(2)	Diversion Channel	R-2-UB-3	PS-02	9,449.165880	0.216923
(a)(2)	Paleo Overflow	R-4-SB-3	IS-01	3,458.620440	0.079399
Total of Other Waters of the United States				186,114.063960	4.272591
TOTAL OF ALL PROPOSED WOUS				186,114.06	4.27
Perennial Creek (Butte Creek)			Diversion Channel (Comanche Creek)		
	R = Riverine			R = Riverine	
	3 = Upper Perennial			2 = Lower Perennial	
	UB = Unconsolidated Bottom			UB = Unconsolidated Bottom	
	1 = cobble-gravel			3 = Mud	
Paleo Overflow			*Based on the USFWS Classification of Wetlands and Deepwater Habitats of the United States (December 1979)		
	R = Riverine				
	4 = Intermittent				
	SB = Streambed				
	3 = Cobble-gravel				

#### 4.1.1 (a)(2) – Tributaries

Butte Creek, a WOUS designated as an a2-tributary, was delineated within the project site. Under guidelines set forth in the *U.S. Fish and Wildlife Service Classification of Deepwater Habitats of the United States* (USFWS 1979). Butte Creek is classified as a R-2 SB-3 (Riverine - Lower Perennial – Streambed – Cobble/Gravel). Butte Creek has a channel that contains flowing water for the entire year, an OHWM as well as a contained bed, bank and scour morphology.

Three features, Butte Creek (PS-01), the diversion channel (Comanche Creek) (PS-02), and the overflow paleo channel (IS-01) were all designated as (a)(2) Tributaries based on current 33 CFR § 328.3 WOUS definitions, totaling 4.27 acres of proposed WOUS delineated within the SA. Classification on Butte Creek and the diversion channel as perennial streams and the paleo overflow channel as an intermittent stream was done utilizing the guidelines set forth in the *U.S. Fish and Wildlife Service Classification of Wetlands and Deepwater Habitats of the United States* (USFWS 1979). Arid West Ephemeral and Intermittent Streams OHWM Datasheets were completed in the field for Butte Creek and can be found in **Appendix F: Field Data Forms**.

Based on the USFWS classification system Butte Creek, the diversion channel and the overflow paleo channel all fall under the Riverine System, which includes in part, all other waters such as intrastate lakes, rivers, streams (including perennial and intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie, potholes, wet meadows, playa lakes, or natural ponds. Butte Creek is classified as Riverine -> Upper Perennial -> Unconsolidated Bottom -> Cobble-Gravel (R-3-UB-1). The diversion channel is classified as Riverine -> Lower Perennial -> Unconsolidated

Bottom -> Mud (R-2-UB-3), and the paleo overflow channel is classified as Riverine -> Intermittent -> Streambed -> Cobble-Gravel (R-4-SB-3).

A discussion of the HFU indicators observed generally across all transects follows:

*4.1.1.1 Low Flow Channel*

Characteristics of the LFCs included cobble textured sediment with no vegetation coverage. The LFC was under water during the time of the January survey and imagery capture, therefore, the LFC points were not recorded using the handheld GPS unit.

*4.1.1.2 Ordinary High Water Mark*

The OHWM across the transects was identifiable through various combinations of changes in average sediment texture, breaks in bank slope, staining on large sedentary boulders across the channel, and changes in both vegetation species and cover.

*4.1.1.3 Active Floodplain*

The AFP across the transects was identifiable through the presence of cobble and the addition of some sand and soil deposits. Additionally, benching and changes in vegetation community succession were also indicative the AFP.

*4.1.1.4 Low Terrace*

The LT across transects was identifiable through the presence of benching, surface relief. The phase of succession of the vegetative community present also served as a strong indicator of the LT.

Results of the field data sheets are summarized on the following page in **Table 4: Field Data Sheet Results Summary**.

***4.2 Non-Jurisdictional Waters (328.3(b))***

No non-jurisdictional waters are proposed within the SA by NorthStar biologists.

Table 4: Parrot-Phelan Field Data Sheet Results Summary.

Transect	River Right / River Left	Floodplain Unit	Average Sediment Texture	OHWM Indicator				Total Veg. Cover				Community Succession				Indicators					Other / Comments	
				Δ sediment texture	Δ vegetation	Δ in vegetation	Break in bank slope	Sum	Tree	Shrub	Herb	N/A	Early (herbaceous & seedlings)	Mid (herbaceous, shrubs, saplings)	Late (herbaceous, shrubs, mature)	Mudcracks	Ribbles	Drift & debris	Presence of bed & benches	Soil development		Surface relief
1	RR	OHWM	cobble	x	x	x	x														sedge/emergent grasses, cocklebur	
		LFC	cobble					0	0	0	0	x									underwater at time of survey	
		AFP	pebble/ cobble					65	30	30	5		x	x	x		x	x	x	x	very active during winter months	
		LT	fine/course sand					95	35	45	15		x	x	x					x	vegetation development	
	RL	OHWM	cobble	x	x	x	x														sedge/emergent grasses	
		LFC	cobble					0	0	0	0	x									underwater at time of survey	
		AFP	cobble					5	0	0	5		x				x		x			
		LT	cobble					60	5	5	50			x					x	x		
2	RR	OHWM	N/A	x	x	x	x														lrg cobble, small boulder, 10% veg cover	
		LFC	cobble					0	0	0	0	x									x	underwater at time of survey
		AFP	pebble/ cobble					30	0	5	25	x					x	x		x	x	
		LT	N/A					85	35	20	30		x	x	x						x	vegetation development
	RL	OHWM	N/A																			ringing/staining, water
		LFC	cobble/ boulder					0	0	0	0	x										underwater at time of survey
		AFP	cobble					5	0	0	5		x						x			
		LT	silt/ fine sand					55	0	5	50		x							x	x	vegetation development
3	RR	OHWM	cobble				x														upstream of extraction material, steep bank	
		LFC	cobble					0	0	0	0	x							x		x	underwater at time of survey
		AFP	cobble					0	0	0	0	x							x			large cobble deposited from upstream
		LT	cobble					50	10	0	40				x				x	x		cobble deposit meet natural slope of bank
	RL	OHWM	N/A	x																		water staining
		LFC	N/A					0	0	0	0	x										underwater at time of survey
		AFP	cobble					10	2	2	6		x							x		
		LT	soil / cobble					70	5	5	60		x								x	x
4	RR	OHWM	N/A	x			x														staining on concrete structure	
		LFC	cobble					0	0	0	0	x							x	x		underwater at time of survey
		AFP	sand / cobble					75	5	50	20		x	x	x			x	x	x		vegetaion signature
		LT	fine					#	5	10	85		x	x	x				x	x		obvious changes in veg and debris
	RL	OHWM	N/A				x															
		LFC	cobble					0	0	0	0	x										undewater at time of survey
		AFP	soil / cobble					65	5	15	45			x						x	x	
		LT	soil/ cobble					70	5	10	55			x							x	x
5	RR	OHWM	boulders / RSP	x	x	x	x															
		LFC	N/A					0	0	0	0	x										
		AFP	sand/boulders					50	5	0	45		x	x	x			x				obvious debris from high flows
		LT	rock / cobble					90		45	45		x	x	x				x	x		
	RL	OHWM	N/A	x			x															staining
		LFC	cobble					0	0	0	0	x										underwater at time of visit
		AFP	soil/ cobble					80	10	35	35		x	x						x	x	
		LT	soil					80	5	25	50		x								x	x
6	RR	OHWM	N/A	x																	visible water line	
		LFC	N/A					0	0	0	0	x										underwater at time of survey
		AFP	sand					30	0	0	30		x							x		
		LT	sand / cobble					85	0	0	85		x							x	x	
	RL	OHWM	N/A				x															
		LFC	N/A					0	0	0	0	x										underwater at time of survey
		AFP	boulder/ cobble/ silt/ sand					80	0	35	45		x	x							x	x
		LT						75	5	10	60		x	x							x	x
7	RR	OHWM	N/A	x																	small cobble	
		LFC	cobble					0	0	0	0	x										underwater at time of visit
		AFP	cobble/ pebble/ sand					5	0	0	5		x							x		rock bar
		LT						5	0	0	5		x							x		top of rock bar
	RL	OHWM	N/A				x															
		LFC	cobble					0	0	0	0	x										underwater at time of visit
		AFP	cobble/ boulder/ sand					#	20	5	75		x	x							x	
		LT						95	0	5	90		x	x							x	
8	RR	OHWM	N/A				x														ringing	
		LFC	cobble					0	0	0	0	x										underwater at time of visit
		AFP	cobble/ boulder/ sand/ silt					35	0	0	35		x						x		x	
		LT						65	0	0	65		x								x	x
	RL	OHWM	N/A				x															
		LFC	cobble					0	0	0	0	x										underwater at time of visit
		AFP	silt/ sand					90	5	5	80		x	x							x	
		LT	N/A					90	5	5	80		x	x	x						x	

## **5. References**

- Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken, editors. 2012. *The Jepson Manual: Vascular Plants of California, Second Edition*. University of California Press, Berkeley, CA.
- Chin, Richard. 2015 *Wetland Delineation Training Manual and Handbook*. Richard Chin Environmental Training Inc. Brandon, FL.
- Cowardin, L.M., et al. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. For the Department of the Interior United States Fish and Wildlife Service. Washington D.C.
- Environmental Laboratory. 1987. *U.S. Army Corps of Engineers Wetlands Delineation Manual*. (Technical Report Y-87-1). U.S. Army Waterways Experiment Station. Vicksburg, MS.
- \_\_\_\_\_. 2006. *Interim Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Arid West Region*. U.S. Army Engineer Research and Development Center Vicksburg, MS.
- Federal Interagency Committee for Wetland Delineation. 1989. *Federal manual for identifying and delineating jurisdictional wetlands. (Cooperative Technical Publication)*. U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and U.S. Soil Conservation Service. Washington, DC.
- Greytag Macbeth. 2000. *Munsell Soil Color Charts Year 2000 Revised Washable Edition*. New Windsor, NY.
- Langbein, W.B., and K.T. Iseri. 1960. General introduction and hydrological definitions manual of hydrology. Part 1 General surface-water techniques. U.S. Geol. Surv. Water-Supp.
- Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2019 *The National Wetland Plant List: 2019 Wetland Ratings*.
- Munsell Color (Firm). 2009 Year Revised / 2017 Production. Munsell Soil Color Charts with genuine Munsell color chips. Grand Rapids, MI.
- Natural Resources Conservation Service. 2010. *Field Indicators of Hydric Soils in the United States*. Version 7.0. L.M Vasilas, G.W. Hurt, and C.V. Noble (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.
- \_\_\_\_\_. 2007. On-line Soil Data Mart – Butte County Area Soil Survey Information (Hydric Soils and Soil Descriptions). Available on-line at <http://soildatamart.nrcs.usda.gov/>.
- \_\_\_\_\_. 2007. *National Hydric Soils List*. Available on-line at <http://soils.usda.gov/use/hydric/>.

- Sawyer, J.O., T. Keeler-Wolf, T., and J.M. Evans, 2008. *A Manual of California Vegetation, Second Edition*, California Native Plant Society Press. Sacramento, CA.
- United States. Army Corps of Engineers. 2019. *Definition of "Waters of the United States"—Recodification of Pre-Existing Rules*.
- \_\_\_\_\_. 2016b. *Updated Map and Drawing Standards for the South Pacific Division Regulatory Program*.
- \_\_\_\_\_. 2010. *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid Region of the Western United States*.
- \_\_\_\_\_. 2008a. *A Field Guide to the Identification of the Ordinary High Water Mark in the Arid Region of the Western United States*.
- \_\_\_\_\_. 2008b. *Regional Supplement to the Corps of Engineers Wetland Delineation manual: Arid West Region (Version 2.0)*.
- \_\_\_\_\_. 2005. *Regulatory Guidance Letter: Ordinary High Water Mark Identification*.
- United States Department of Agriculture. 2020. Web Soil Survey. Available online at [websoilsurvey.sc.egov.usda.gov/App/HomePage.htm](http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm).
- United States Department of Agriculture. 2006. *Soil Survey of Butte Area, California, Parts of Butte and Plumas Counties*. Natural Resources Conservation Service.
- United States Fish and Wildlife Service. 2006. Sacramento Fish and Wildlife Office: *Endangered Species Program, Species and Habitat Information*. Sacramento, CA.
- Western Regional Climate Center. 2020. *Chico Univ Farm, California, Period of Record General Climate Summary – Temperature and Precipitation, Station:(041715) CHICO EXPERIMENT STN, From Year=1906 To Year=2012*.

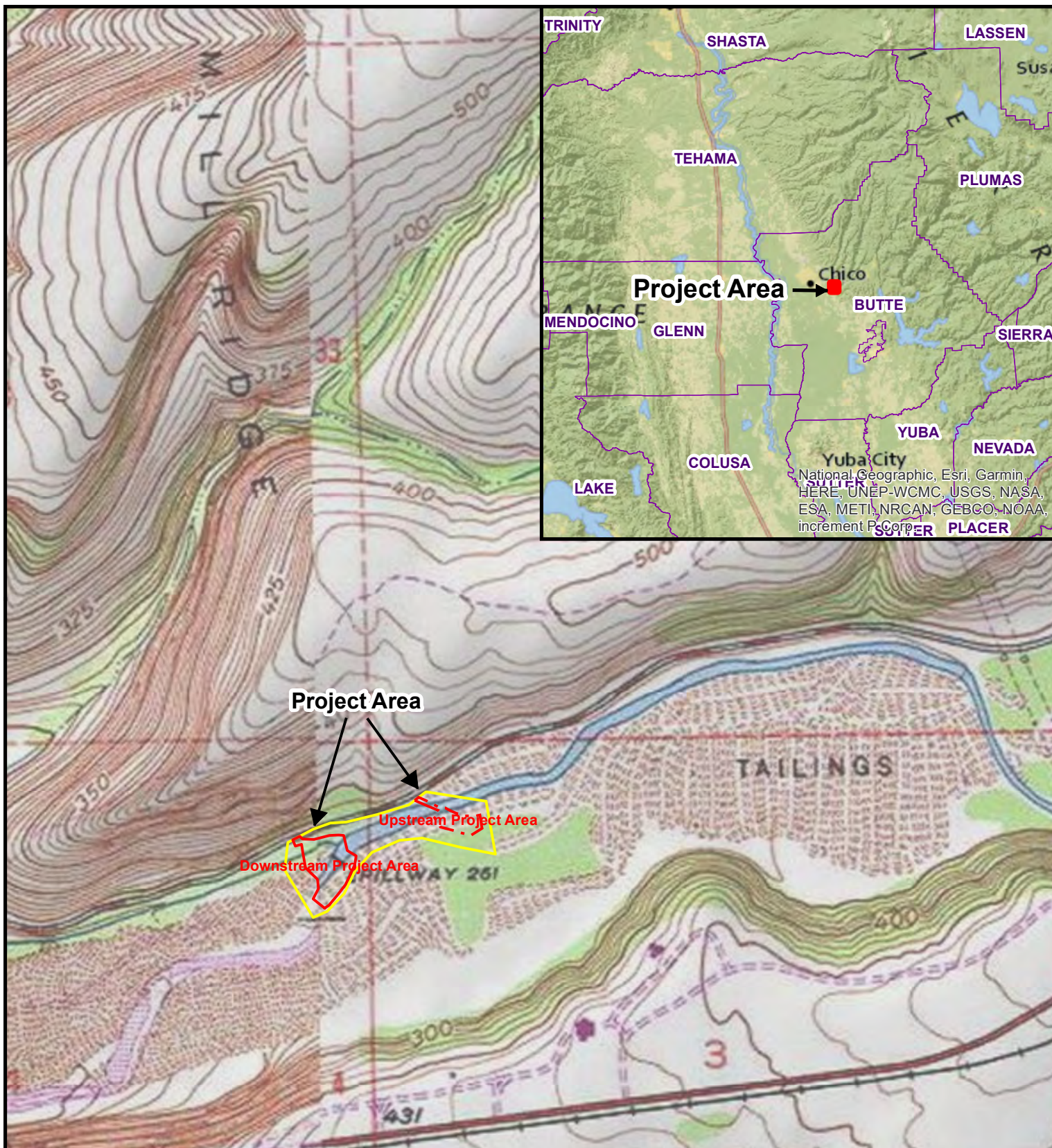
*Figure 1-Location Map*

*Figure 2-Soil Map*

*Figure 3-Delineation of the Waters of the United States Map*

*Figure 4-National Wetlands Inventory Map*





## Legend

- Downstream Project Area (3.31 ac)
- Upstream Project Area (1.18 ac)
- Biological Survey Area (13.92 ac)

0 500 1,000 2,000  
Feet  
1 inch = 1,000 ft (printed at 8.5 x 11)

Imagery Source:  
USGS Topo  
Inset Imagery:  
National Geographic



Within Sections 2,3,4,  
Township 21N, Range 02E,  
Butte County, CA  
CHICO & HAMLIN CANYON  
USGS 7.5' Quad

Map Date:  
June 26, 2020

Drawn By:  
BSA

NSE Project #  
18-019

## Figure 1: Location Map

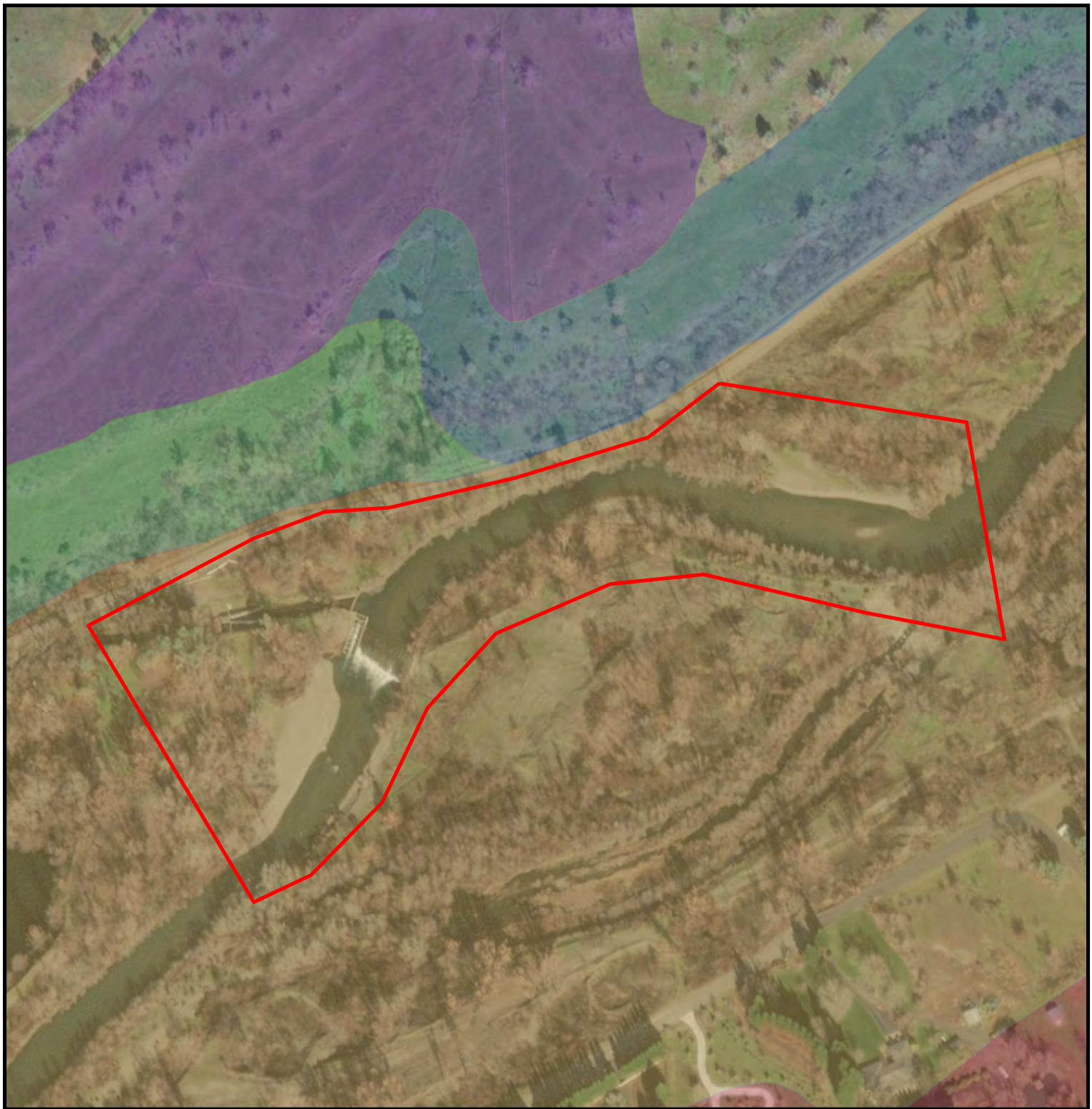
Parrott-Phelan Restoration  
- Butte County, CA -



**NORTHSTAR**  
... Designing Solutions

111 MISSION RANCH BLVD., SUITE 100 CHICO, CA 95926  
PHONE: (530) 893-1600 - [www.NorthStarEng.com](http://www.NorthStarEng.com) - © NorthStar





### Legend

Project

### Soil Type

JOKERST-DOEMILL-TYPIC HAPLOXERALS COMPLEX, 15 TO 30 PERCENT SLOPES

JOKERST-DOEMILL-TYPIC HAPLOXERALS COMPLEX, 8 TO 15 PERCENT SLOPES

REDSLUFF GRAVELLY LOAM, 0 TO 2 PERCENT

XERORTHENTS, SHALLOW-TYPIC HAPLOXERALS-ROCK OUTCROP, CLIFFS COMPLEX, 30 TO 50 PERCENT SLOPES

XERORTHENTS, TAILINGS, 0 TO 50 PERCENT

0 0.0425 0.085  
Miles

1 inch = 250 ft (printed @ 8.5 x 11)

Imagery Source:  
ESRI, Digital Globe  
Imagery Date:  
10/30/2019



## Figure 2: Soils Map

Parrott-Phelan  
Resoration and Maintenance  
Project - Butte County, CA

Map Date:  
July 1, 2020

Drawn By:  
BSA

NSE Project #  
18-019



**NORTHSTAR**

... Designing Solutions

111 MISSION RANCH BLVD., SUITE 100 CHICO, CA 95926  
PHONE: (530) 893-1600 - [www.NorthStarEng.com](http://www.NorthStarEng.com) - © NorthStar



RR = River Right / RL = River Left  
(when looking downstream)

OHHM = Ordinary  
High Water Mark

AFP = Active  
Floodplain

LT = Low  
Terrace

**Figure 3: Aquatic Resources Map  
(Proposed Waters of the United States)**

Parrott-Phelan Restoration and Maintenance  
Project (APNs 017-280-143 & 017-270-029)  
- Butte Creek, Chico, Butte County, CA -

**PROPOSED WATERS OF THE UNITED STATES (WOUS)**

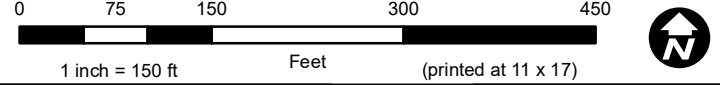
Type	Description	Class*	Label	Area (ft²)	Area (ac)
Other Waters of the United States					
(a)(2)	Perennial Creek	R-3-UB-1	PS-01	173,206.277640	3.976269
(a)(2)	Diversion Channel	R-2-UB-3	PS-02	9,449.165880	0.216923
(a)(2)	Paleo Overflow	R-4-SB-3	IS-01	3,458.620440	0.079399
Total of Other Waters of the United States				186,114.063960	4.272591

**TOTAL OF ALL PROPOSED WOUS** 186,114.06 4.27

Perennial Stream = PS		Intermittent Stream = IS	
Butte Creek (Perennial Stream)		Diversion Channel (Comanche Creek)	
R = Riverine		R = Riverine	
3 = Upper Perennial		2 = Lower Perennial	
UB = Unconsolidated Bottom		UB = Unconsolidated Bottom	
1 = cobble-gravel		3 = Mud	

Paleo Overflow		*Based on the USFWS
R = Riverine		Classification of Wetlands and
4 = Intermittent		Deepwater Habitats of the
SB = Streambed		United States (December 1979)
3 = Cobble-gravel		

- USACE Survey Area (13.92 ac)
- Butte County Parcels
- Direction of Flow
- Topo (11/1/2018, NS)
- Proposed WOUS (4.27 ac)
- 328\_3Type
- (a)(2) - Tributary (4.27 ac)
- n/a - Structure (Fish Ladder)
- Butte County Roads
- Active Floodplain
- Low Terrace
- Fyke Pipe Outfall
- USACE ARD
- Proposed WOUS (4.27 ac)
- (a)(2) - Tributary (4.27 ac)
- n/a - Structure



Surveyed By: CJW, MSR, ADH, BSA, JS, TA	NSE Project No. 18-019	USACE SPK No.: TBD
Survey Dates: 3/7/2018, 3/29/2018, 10/1/2018, 8/12/2019, 9/5/2019, 1/7-8/2020	Drawn By: CJW	Imagery: 7JAN2020 NorthStar Drone Capture

Original Map Date: 26JUNE2020 Revised Map Date: N/A

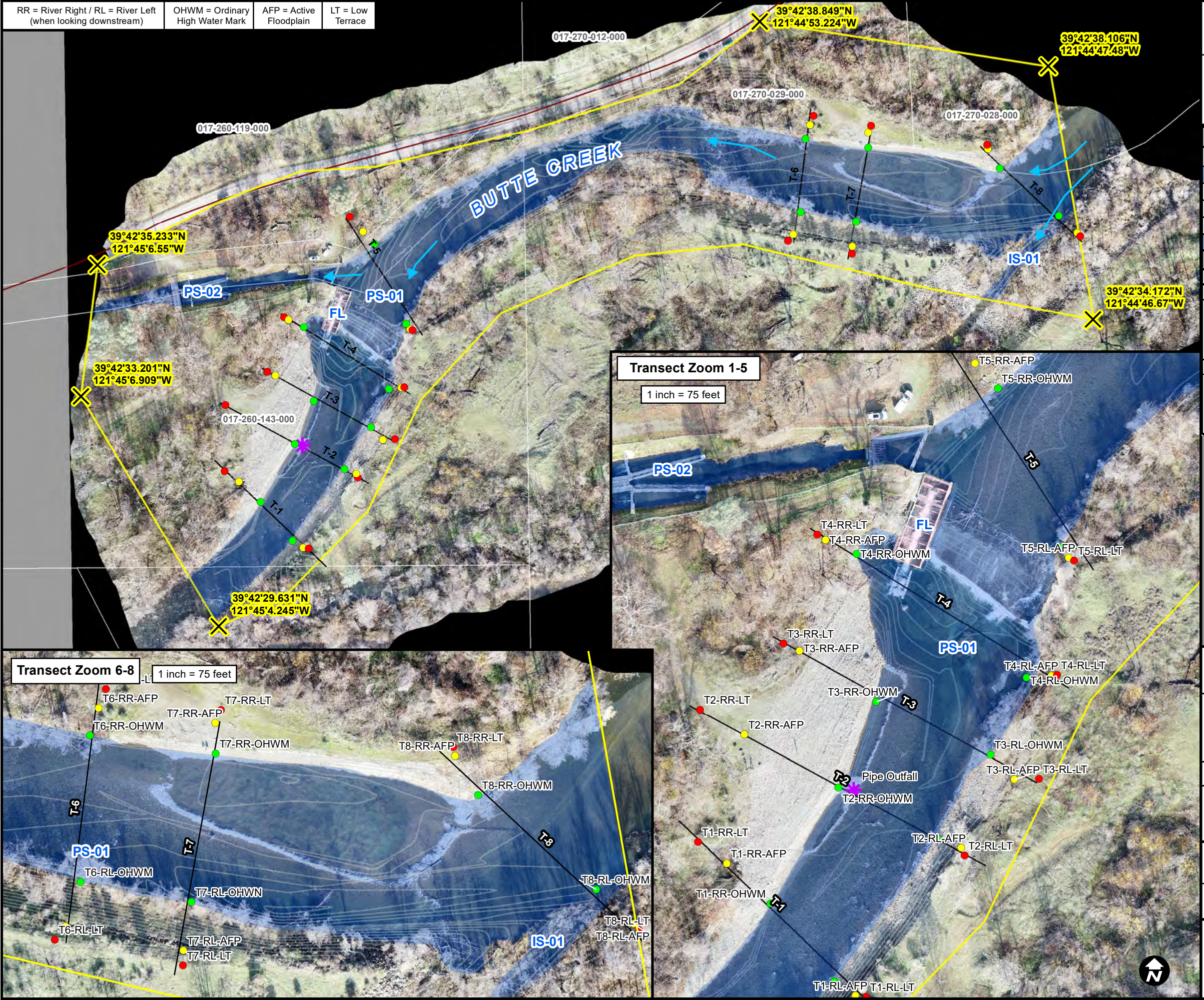
Within Sections 2-4, Township 21N, Range 02E, Butte County, CA CHICO & HAMLIN CANYON USGS 7.5' Quads	Coordinate System: NAD 1983 UTM Zone 10 Projection: Transverse Mercator Datum: North American 1983
---	---

Made in accordance with the "Updated Map and Drawing  
Standards for the South Pacific Division Regulatory Program",  
as amended on February 10, 2016

All features to remain preliminary until written verification received  
from the U.S. Army Corps of Engineers.

**NORTHSTAR**

111 MISSION RANCH BLVD., SUITE 100 CHICO, CA 95926  
PHONE: (530) 893-1600 - www.NorthStarEng.com - © NorthStar







U.S. Fish and Wildlife Service


# National Wetlands Inventory

## Parrott-Phelan NWI Map



June 30, 2020

### Wetlands

	Estuarine and Marine Deepwater		Freshwater Emergent Wetland		Lake
	Estuarine and Marine Wetland		Freshwater Forested/Shrub Wetland		Other
			Freshwater Pond		Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.







PHOTO 1 -

Parrott-Phelan  
Restoration.

Gravel bar to be  
excavated.

Standing on the north  
bank of Butte Creek,  
facing east  
(upstream).

12 August 2019



PHOTO 2 -

Parrott Phelan  
Restoration.

Gravel bar to be  
excavated (on left  
side of photo).

Standing within the  
channel of Butte  
Creek facing east.  
(upstream).

12 August 2019

Parrott-Phelan Restoration  
Butte Co, CA

NSE No. 18-019



Representative Site Photos

PAGE 1 OF 8





PHOTO 3 -

Parrott-Phelan  
Restoration.

Gravel bar to be  
excavated on far-right  
side of photo.

Standing within the  
channel of Butte  
Creek facing  
northwest  
(downstream).

12 August 2019



PHOTO 4 -

Parrott Phelan  
Restoration.

Upstream end of the  
gravel bar to be  
excavated.

Standing on the south  
bank of Butte Creek  
facing south.

12 August 2019

Parrott-Phelan Restoration  
Butte Co, CA

NSE No. 18-019

Representative Site Photos

PAGE 2 OF 8







PHOTO 5 -

Parrott-Phelan  
Restoration.

Upstream end of the  
gravel bar to be  
excavated.

Standing on the north  
bank of Butte Creek,  
facing south.

12 August 2019



PHOTO 6 -

Parrott Phelan  
Restoration.

View of Butte Creek  
and surrounding  
habitat from the  
upstream end of the  
gravel bar to be  
excavated.

Standing on the north  
bank of Butte Creek  
facing east  
(upstream).

5 September 2019

Parrott-Phelan Restoration  
Butte Co, CA

NSE No. 18-019



Representative Site Photos

PAGE 3 OF 8





PHOTO 7 -

Parrott-Phelan  
Restoration.

View of Butte Creek  
and surrounding  
habitat downstream of  
the gravel bar to be  
excavated..

Standing within the  
channel of Butte  
Creek facing west  
(downstream)

1 October 2018



PHOTO 8 -

Parrott Phelan  
Restoration.

Dirt road that runs  
from Honey Run  
Road to the upstream  
managed gravel bar.

Standing on the north  
bank of Butte Creek  
facing north, towards  
Honey Run Road.

5 September 2019





PHOTO 9 -

Parrott-Phelan  
Restoration.

View of dam and fish  
ladder that will be  
protected by proposed  
work.

Standing on the south  
bank of Butte Creek  
facing northeast  
(upstream).

12 August 2019



PHOTO 10 -

Parrott Phelan  
Restoration.

View of the erosion  
damage to the dam  
along the southern  
bank of Butte Creek.

Standing on the  
southern bank of  
Butte Creek facing  
northeast (upstream).

1 October 2018





PHOTO 11 -

Parrott-Phelan  
Restoration.

View of fyke trap  
used to research  
anadromous fish.

Standing north of  
Butte Creek facing  
west.

5 August 2019



PHOTO 12 -

Parrott Phelan  
Restoration.

View of fyke outfall  
pipe (underwater).

Standing on the north  
side of Butte Creek  
facing south.

18 May 2020

Parrott-Phelan Restoration  
Butte Co, CA

NSE No. 18-019

Representative Site Photos

PAGE 7 OF 8







PHOTO 13 - Parrott-Phelan Restoration – Transect 2, River Left  
Standing on the southern bank of Butte Creek facing east.

7 January 2020



PHOTO 14 - Parrott-Phelan Restoration – Transect 5, River Right  
Standing on the northern bank of Butte Creek facing west.


8 January 2020

Parrott-Phelan Restoration  
Butte Co, CA

NSE No. 18-019

 **LT**  
Low  
Terrace

 **AFP**  
Active  
Flood  
Plain

 **OHWM**  
Ordinary  
High Water  
Mark

**LFC**  
Low Flow  
Channel  
(not pictured)

 **NORTHSTAR**  
... Designing Solutions

Representative Site Photos

PAGE 7 OF 8





PHOTO 15 - Parrott-Phelan Restoration – Transect 6, River Right  
Standing on the northern bank of Butte Creek facing west.

8 January 2020



PHOTO 16 - Parrott-Phelan Restoration – Transect 8, River Left  
Standing on the southern bank of Butte Creek facing east.


8 January 2020

Parrott-Phelan Restoration  
Butte Co, CA

NSE No. 18-019

 **LT**  
Low  
Terrace

 **AFP**  
Active  
Flood  
Plain

 **OHWM**  
Ordinary  
High Water  
Mark

**LFC**  
Low Flow  
Channel  
(not pictured)

Representative Site Photos

PAGE 8 OF 8

 **NORTHSTAR**  
... Designing Solutions





Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude	Local_Waterway	Similarly_Situated	Sim_Situated	Adjacent_Waters_Subjct_33USC1344	OHWM_Chg_In_Plant_Community	OHWM_Bed_And_Banks	OHWM_Break_In_Slope	OHWM_Chg_In_Character_Of_Soil	OHWM_Chg_In_Veg_Density_Maturity	OHWM_Chg_In_Sediment_Texture	OHWM_Line_Impressed_On_Bank	OHWM_Leaf_Litter_Disturbed	OHWM_Multiple_Flow_Events	OHWM_Scour	OHWM_Sediment_Deposition	OHWM_Sediment_Sorting	OHWM_Shelving	OHWM_Litter_and_Debris_Present	OHWM_Veg_Matted_Bent_Or_Absent	OHWM_Water_Staining	OHWM_Other	OHWM_Other_Text	Func_I_Sediment_Trapping	Func_II_Nutrient_Recycling	Func_III_Pollutant_Management	Func_IV_Retain_Atenu_Fld_Wtrs	Func_V_Runoff_Storage	Func_VI_Contribution_of_Flow	Func_VII_Export_Organic_Matter	Func_VIII_Export_Food_Resour	Func_IX_Prov_Life		
Butte Creek (perennial creek)	CALIFORNIA	R3UB1	RIVERINE	Area	3.976269	ACRE	A2O	39.70846111	-121.75108611	Butte Creek	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES	NO	NO		YES	YES	YES	YES	YES	YES	YES	YES	YES	
Diversion Channel	CALIFORNIA	R2UB3	RIVERINE	Area	0.216923	ACRE	A2O	39.70967500	-121.75083611	Comanche Creek (Parrott-Phelan) Diversion	YES	YES	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES	NO	YES	NO	NO		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	
Paleo Channel	CALIFORNIA	R4SB3	RIVERINE	Area	0.079399	ACRE	A2B	39.70916944	-121.74726944	Paleo Flood Channel of Butte Creek	YES	YES	YES	YES	NO	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES	NO	YES	NO	YES	NO	NO		NO	NO	YES	YES	YES	NO	YES	YES	YES	YES

**Adjacent wetlands.** The term adjacent wetlands means wetlands that: (i) Abut, meaning to touch at least at one point or side of, a water identified in paragraph (a)(1), (2), or (3) of this section; (ii) Are inundated by flooding from a water identified in paragraph (a)(1), (2), or (3) of this section in a typical year; (iii) Are physically separated from a water identified in paragraph (a)(1), (2), or (3) of this section only by a natural berm, bank, dune, or similar natural feature; or (iv) Are physically separated from a water identified in paragraph (a)(1), (2), or (3) of this section only by an artificial dike, barrier, or similar artificial structure so long as that structure allows for a direct hydrologic surface connection between the wetlands and the water identified in paragraph (a)(1), (2), or (3) of this section in a typical year, such as through a culvert, flood or tide gate, pump, or similar artificial feature. An adjacent wetland is jurisdictional in its entirety when a road or similar artificial structure divides the wetland, as long as the structure allows for a direct hydrologic surface connection through or over that structure in a typical year.

**Active floodplain:** Surface adjacent to and receiving frequent over-bank flow from the low flow channel. Inundated during low and moderate flow events, characterized by high flow channels, generally unvegetated surfaces, and frequently a break in slope at either margin.

**Atypical situation (significantly disturbed):** In an atypical (significantly disturbed) situation, recent human activities or natural events have created conditions where positive indicators for hydrophytic vegetation, hydric soil, or wetland hydrology are not present or observable.

**Chroma:** The relative purity or saturation of a color; one of the three variables of color.

**Cobble/Gravel:** The unconsolidated particles smaller than stones are predominantly cobble and gravel, although finer sediments may be intermixed.

**Ditch:** The term ditch means a constructed or excavated channel used to convey water.

**Ephemeral:** The term ephemeral means surface water flowing or pooling only in direct response to precipitation (e.g., rain or snow fall)

**Growing season:** The growing season is the portion of the year when soil temperatures at 19.7 inches below the soil surface are above biologic zero (41° F) as defined by soil taxonomy.

**Hydric soil:** Soil is hydric that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic (oxygen-depleted) conditions in its upper part (*i.e.* within the shallow rooting zone of herbaceous plants).

**Hydrophytes, hydrophytic:** Any plant growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.

**Intermittent:** The term intermittent means surface water flowing continuously during certain times of the year and more than in direct response to precipitation (e.g., seasonally when the groundwater table is elevated or when snowpack melts).



**Inundation:** A condition in which water from any source temporarily or permanently covers a land surface.

**Low flow channel:** Well defined bed and bank, in perennial systems and stable over time, in ephemeral and intermittent systems unstable over time. Distinct vegetation tends to be dynamic due to episodic discharge patterns.

**Low terrace:** Area outside of the active floodplain, only inundated during extreme flow events. The low terrace contains paleo channels and isolated depressions. Vegetation is generally comprised of late successional species when may include mature pioneering trees and upland species.

**Non-jurisdictional waters.** For purposes of the Clean Water Act, 33 U.S.C. 1251 et seq. and its implementing regulations, the term “Non-jurisdictional waters” (i.e. not “waters of the United States”) applies to the following: (1) Waters or water features that are not identified in paragraph (a)(1), (2), (3), or (4) of part a; (2) Groundwater, including groundwater drained through subsurface drainage systems; (3) Ephemeral features, including ephemeral streams, swales, gullies, rills, and pools; (4) Diffuse stormwater run-off and directional sheet flow over upland; (5) Ditches that are not waters identified in paragraph (a)(1) or (2) of this 328.3, and those portions of ditches constructed in waters identified in paragraph (a)(4) of this section that do not satisfy the conditions of paragraph (c)(1) of 328.3; (6) Prior converted cropland; (7) Artificially irrigated areas, including fields flooded for agricultural production, that would revert to upland should application of irrigation water to that area cease; (8) Artificial lakes and ponds, including water storage reservoirs and farm, irrigation, stock watering, and log cleaning ponds, constructed or excavated in upland or in non-jurisdictional waters, so long as those artificial lakes and ponds are not impoundments of jurisdictional waters that meet the conditions of paragraph (c)(6) of 328.3; (9) Water-filled depressions constructed or excavated in upland or in non-jurisdictional waters incidental to mining or construction activity, and pits excavated in upland or in non-jurisdictional waters for the purpose of obtaining fill, sand, or gravel; (10) Stormwater control features constructed or excavated in upland or in non-jurisdictional waters to convey, treat, infiltrate, or store stormwater run-off; (11) Groundwater recharge, water reuse, and wastewater recycling structures, including detention, retention, and infiltration basins and ponds, constructed or excavated in upland or in non-jurisdictional waters; and (12) Waste treatment systems.

**Normal circumstances:** This term refers to the soil and hydrologic conditions that are normally present, without regard to whether the vegetation has been removed.

**Ordinary High Water Mark:** The term *ordinary high water mark* means 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. (33CFR 328.3(e))

**Perennial:** The term perennial means surface water flowing continuously year-round.

**Plant indicator status categories:** For the purposes of this supplement, only the five basic levels of wetland indicator status were utilized.

*Obligate wetland plants (OBL)* – plants that occur almost always (estimated probability 99%) in wetlands under normal conditions, but which may also occur rarely (estimated probability 1%) in non-wetlands.

*Facultative wetland plants (FACW)* – plants that usually occur (estimated probability 67% to 99%) in wetlands under normal conditions, but also occur (estimated probability 1% to 33%) in non-wetlands.

*Facultative plants (FAC)* – Plants with a similar likelihood (estimated probability 33% to 67%) of occurring in both wetlands and non-wetlands.

*Facultative upland plants (FACU)* – Plants that occur sometimes (estimated probability 1% to 33%) occur in wetlands, but occur more often (estimated probability 67% to 99%) in non-wetlands.

*Obligate upland plants (UPL)* – Plants that occur rarely (estimated probability 1%) in wetlands, but occur almost always (estimated probability 99%) in non-wetlands under natural conditions.

**Ponded:** Ponding is a condition in which free water covers the soil surface (e.g., in a closed depression) and is removed only by percolation, evaporation, or transpiration.

**Riverine:** The Riverine System includes all wetlands and deepwater habitats contained within a channel, with two exceptions: (1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts in excess of 0.5%. A channel is “an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water” (Langbein and Iseri 1960:5).

**Streambed:** The Class Streambed includes all wetland contained within the Intermittent Subsystem of the Riverine System and all channels of the Estuarine System or of the Tidal System of the Riverine System that are completely dewatered at low tide. Water regimes area restricted to irregularly exposed, regularly flooded, irregularly flooded, seasonally flooded, temporarily flooded, and intermittently flooded.

**Traditional navigable water:** Includes all of the “navigable water of the United States,” defined in 33 C.F.R. § 329, and by numerous decisions of the Federal courts, plus all waters that are navigable-in-fact. As defined in 33 C.F.R. § 329, “Navigable waters of the United States are those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. A determination of navigability, once made, applies laterally over the entire surface of the water

body, and is not extinguished by later actions or events which impede or destroy navigable capacity.”

**Tributary.** The term tributary means a river, stream, or similar naturally occurring surface water channel that contributes surface water flow to a water identified in paragraph (a)(1) of Section 328.3(a) in a typical year either directly or through one or more waters identified in paragraph (a)(2), (3), or (4) of this section. A tributary must be perennial or intermittent in a typical year. The alteration or relocation of a tributary does not modify its jurisdictional status as long as it continues to satisfy the flow conditions of this definition. A tributary does not lose its jurisdictional status if it contributes surface water flow to a downstream jurisdictional water in a typical year through a channelized non-jurisdictional surface water feature, through a subterranean river, through a culvert, dam, tunnel, or similar artificial feature, or through a debris pile, boulder field, or similar natural feature. The term tributary includes a ditch that either relocates a tributary, is constructed in a tributary, or is constructed in an adjacent wetland as long as the ditch satisfies the flow conditions of this definition.

**Unconsolidated Bottom:** The Class Unconsolidated Bottom includes all wetland and deepwater habitats with at least 25% cover of particles smaller than stones and a vegetative cover less than 30%. Water regimes are restricted to subtidal, permanently flooded, intermittently exposed, and semi-permanently flooded.

**Upland:** The term upland means any land area that under normal circumstances does not satisfy all three wetland factors (i.e., hydrology, hydrophytic vegetation, hydric soils) identified in paragraph (c)(16) of section 328.3, and does not lie below the ordinary high water mark or the high tide line of a jurisdictional water.

**Waters of the United States:** For purposes of the Clean Water Act, 33 U.S.C. 1251 *et seq.* and its implementing regulations, the term “waters of the United States” means: (1) The territorial seas, and waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including waters which are subject to the ebb and flow of the tide; (2) Tributaries; (3) Lakes and ponds, and impoundments of jurisdictional waters; and (4) Adjacent wetlands.

**Western vernal pools:** Western vernal pools are seasonal wetlands located in parts of California and associated with topographic depression, soils with poor drainage, mild, wet winters and hot, dry summers.

**Wetlands:** The term wetlands means areas that are inundated or saturated by surface or ground water 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. Wetlands generally include swamps, marshes, bogs, and similar areas. To be considered under federal jurisdiction, a wetland must support positive indicators for hydrophytic vegetation, hydric soil, and wetland hydrology.





United States  
Department of  
Agriculture

**NRCS**

Natural  
Resources  
Conservation  
Service

A product of the National  
Cooperative Soil Survey,  
a joint effort of the United  
States Department of  
Agriculture and other  
Federal agencies, State  
agencies including the  
Agricultural Experiment  
Stations, and local  
participants

# Custom Soil Resource Report for Butte Area, California, Parts of Butte and Plumas Counties

**Parrott-Phelan Restoration**



September 26, 2018

# Preface

---

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2\\_053951](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

# Contents

---

<b>Preface</b> .....	2
<b>How Soil Surveys Are Made</b> .....	5
<b>Soil Map</b> .....	8
Soil Map (Parrott-Phelan).....	9
Legend.....	10
Map Unit Legend (Parrott-Phelan).....	12
Map Unit Descriptions (Parrott-Phelan).....	12
Butte Area, California, Parts of Butte and Plumas Counties.....	14
118—Xerorthents, Tailings and 0 to 50 percent slopes.....	14
<b>References</b> .....	16



# How Soil Surveys Are Made

---

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

## Custom Soil Resource Report

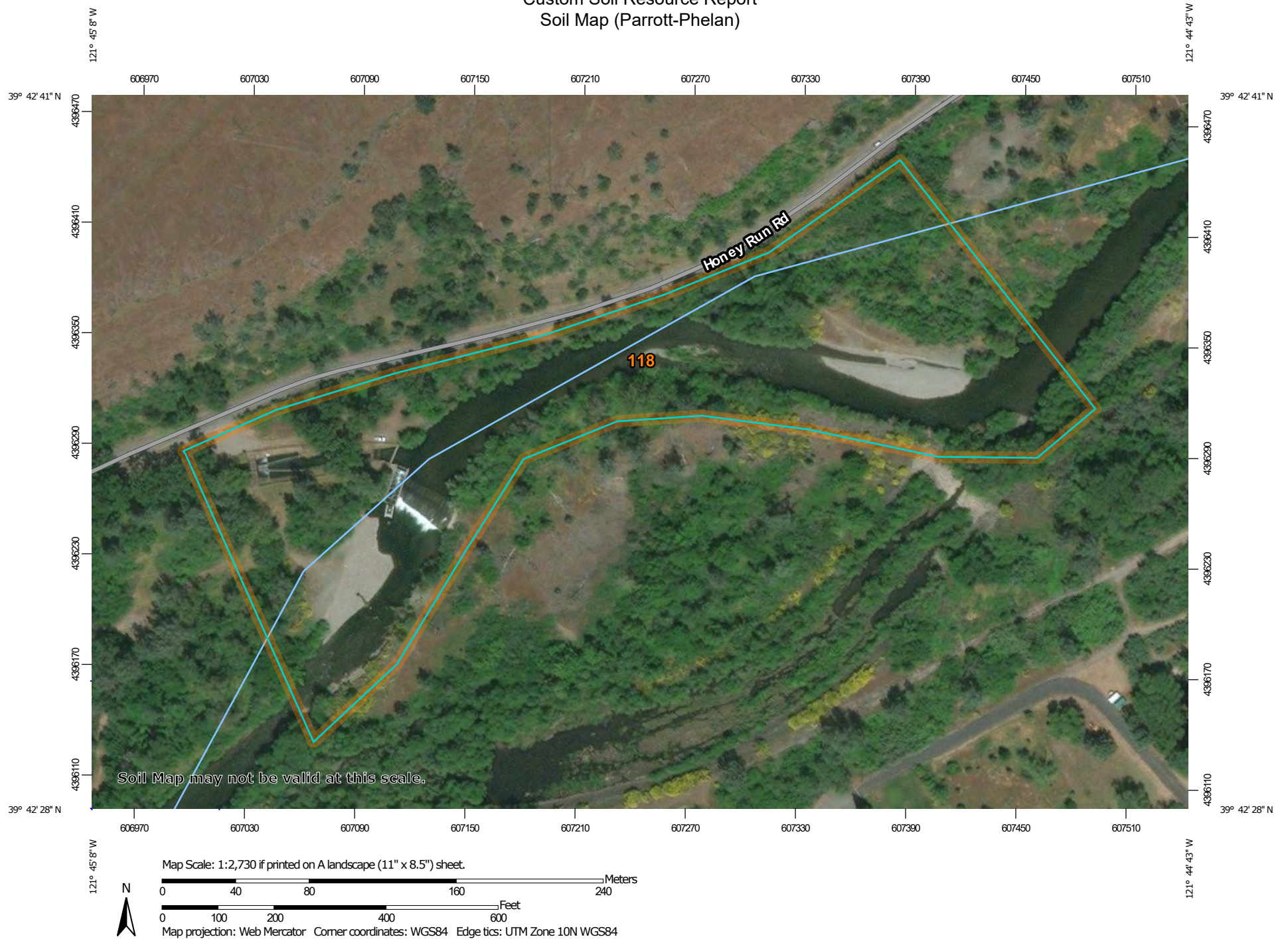
identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

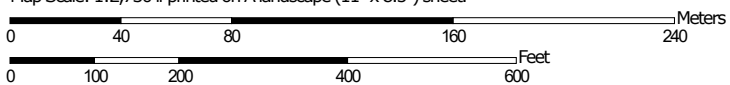
---

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report Soil Map (Parrott-Phelan)



Map Scale: 1:2,730 if printed on A landscape (11" x 8.5") sheet.




Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

# Custom Soil Resource Report


## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)


### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features

 Blowout

 Borrow Pit

 Clay Spot


 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

### Water Features

 Streams and Canals

### Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL:  
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Butte Area, California, Parts of Butte and Plumas Counties  
Survey Area Data: Version 15, Sep 12, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 21, 2015—Oct 18, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

## MAP LEGEND

## MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.



## Map Unit Legend (Parrott-Phelan)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
118	Xerorthents, Tailings and 0 to 50 percent slopes	12.3	100.0%
<b>Totals for Area of Interest</b>		<b>12.3</b>	<b>100.0%</b>

## Map Unit Descriptions (Parrott-Phelan)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## Butte Area, California, Parts of Butte and Plumas Counties

### 118—Xerorthents, Tailings and 0 to 50 percent slopes

#### Map Unit Setting

*National map unit symbol:* hgxl  
*Elevation:* 90 to 1,340 feet  
*Mean annual precipitation:* 21 to 50 inches  
*Mean annual air temperature:* 57 to 63 degrees F  
*Frost-free period:* 240 to 260 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Xerorthents and similar soils:* 80 percent  
*Minor components:* 20 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Xerorthents

##### Setting

*Landform:* Flood plains  
*Landform position (two-dimensional):* Toeslope  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex, linear  
*Parent material:* Dredged spoil piles from gravelly alluvium derived from igneous, metamorphic and sedimentary rock

##### Typical profile

*A - 0 to 3 inches:* very gravelly sandy loam  
*AC - 3 to 8 inches:* extremely gravelly sandy loam  
*C1 - 8 to 21 inches:* loamy sand  
*C2 - 21 to 26 inches:* loamy sand  
*C3 - 26 to 35 inches:* loamy sand  
*C4 - 35 to 48 inches:* loamy coarse sand  
*C5 - 48 to 59 inches:* loamy sand  
*C6 - 59 to 81 inches:* loamy sand

##### Properties and qualities

*Slope:* 0 to 50 percent  
*Percent of area covered with surface fragments:* 0.0 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Somewhat excessively drained  
*Runoff class:* Very low  
*Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 4.25 in/hr)  
*Depth to water table:* About 60 to 80 inches  
*Frequency of flooding:* Occasional  
*Frequency of ponding:* None  
*Available water storage in profile:* Low (about 3.6 inches)

##### Interpretive groups

*Land capability classification (irrigated):* 4e  
*Land capability classification (nonirrigated):* 4e  
*Hydrologic Soil Group:* A

*Hydric soil rating: Yes*

**Minor Components**

**Unnamed, riparian areas**

*Percent of map unit: 5 percent*

*Landform: Flood plains*

*Hydric soil rating: Yes*

**Pits, water-filled**

*Percent of map unit: 5 percent*

*Landform: Flood plains*

*Hydric soil rating: Yes*

**Xeropsamments, tailings**

*Percent of map unit: 3 percent*

*Landform: Flood plains*

*Hydric soil rating: Yes*

**Xerofluvents, tailings**

*Percent of map unit: 3 percent*

*Landform: Flood plains*

*Hydric soil rating: Yes*

**Unnamed, duripan**

*Percent of map unit: 2 percent*

*Landform: Terraces*

*Hydric soil rating: Yes*

**Haploxeralfs, terrace**

*Percent of map unit: 2 percent*

*Landform: Stream terraces*

*Hydric soil rating: No*

# References

---

- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
- American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
- Federal Register. July 13, 1994. Changes in hydric soils of the United States.
- Federal Register. September 18, 2002. Hydric soils of the United States.
- Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
- National Research Council. 1995. Wetlands: Characteristics and boundaries.
- Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_054262](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262)
- Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053577](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577)
- Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053580](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580)
- Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
- United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2\\_053374](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374)
- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

## Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2\\_054242](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242)

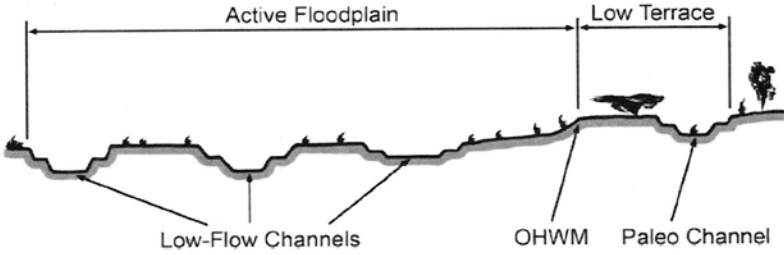
United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2\\_053624](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624)

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. [http://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs142p2\\_052290.pdf](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf)



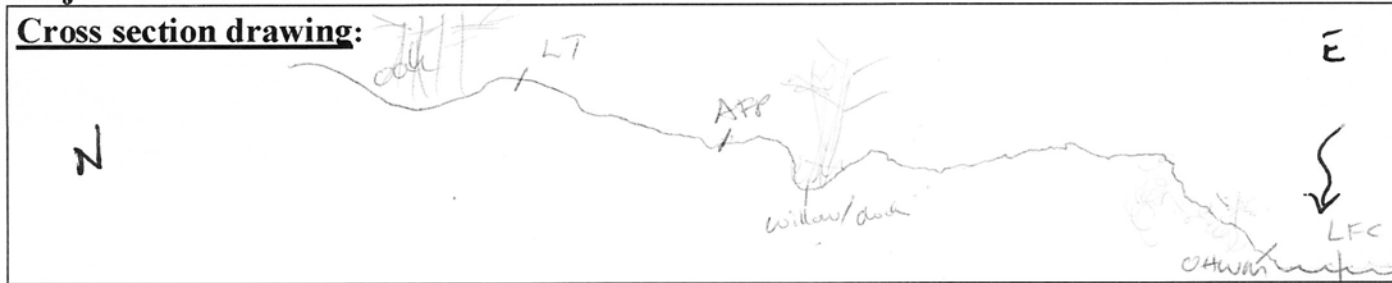


## Arid West Ephemeral and Intermittent Streams OTHM Datasheet

<b>Project:</b> Parrot-Phelan Restoration <b>Project Number:</b> 18-019 <b>Stream:</b> Butte Creek <b>Investigator(s):</b> CJW, ADH, JS, BSAJDA	<b>Date:</b> 1-7-2020 <b>Town:</b> Chico <b>Photo begin file#:</b> <b>Time:</b> 0936 <b>State:</b> CA <b>Photo end file#:</b>		
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?  Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?	<b>Location Details:</b> off Honey Run Rd. S.E. of Chico <b>Projection:</b> Transverse Mercator <b>Datum:</b> NAD 83 10W <b>Coordinates:</b> 39°42'30.5" N 121°45'04.02" W		
<b>Potential anthropogenic influences on the channel system:</b> Development w/in area, gravel removal, storm water run off from Camp Fire burn scar			
<b>Brief site description:</b> down stream side of gravel bar			
<b>Checklist of resources (if available):</b> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Aerial photography            Dates: 1-7-2020  <input checked="" type="checkbox"/> Topographic maps  <input type="checkbox"/> Geologic maps  <input type="checkbox"/> Vegetation maps  <input checked="" type="checkbox"/> Soils maps  <input type="checkbox"/> Rainfall/precipitation maps  <input type="checkbox"/> Existing delineation(s) for site  <input checked="" type="checkbox"/> Global positioning system (GPS)  <input type="checkbox"/> Other studies         </td> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Stream gage data            Gage number:            Period of record:  <input type="checkbox"/> History of recent effective discharges  <input type="checkbox"/> Results of flood frequency analysis  <input type="checkbox"/> Most recent shift-adjusted rating  <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event         </td> </tr> </table>		<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input checked="" type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event
<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input checked="" type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event		
<b>Hydrogeomorphic Floodplain Units</b> 			
<b>Procedure for identifying and characterizing the floodplain units to assist in identifying the OTHM:</b> <ol style="list-style-type: none"> <li>1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.</li> <li>2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.</li> <li>3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.           <ol style="list-style-type: none"> <li>a) Record the floodplain unit and GPS position.</li> <li>b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.</li> <li>c) Identify any indicators present at the location.</li> </ol> </li> <li>4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.</li> <li>5. Identify the OTHM and record the indicators. Record the OTHM position via:           <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Mapping on aerial photograph  <input checked="" type="checkbox"/> Digitized on computer           </td> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> GPS  <input checked="" type="checkbox"/> Other: Surveyed 2020, 11/1/2018           </td> </tr> </table> </li> </ol>		<input checked="" type="checkbox"/> Mapping on aerial photograph <input checked="" type="checkbox"/> Digitized on computer	<input checked="" type="checkbox"/> GPS <input checked="" type="checkbox"/> Other: Surveyed 2020, 11/1/2018
<input checked="" type="checkbox"/> Mapping on aerial photograph <input checked="" type="checkbox"/> Digitized on computer	<input checked="" type="checkbox"/> GPS <input checked="" type="checkbox"/> Other: Surveyed 2020, 11/1/2018		

Project ID: 18-019 Cross section ID: T1-RR Date: 1-7-2020 Time: 0936

**Cross section drawing:**



**OHWM**

GPS point: T1-RR-OHWM

**Indicators:**

- ☒ Change in average sediment texture  
☒ Change in vegetation species  
☒ Change in vegetation cover

- ☒ Break in bank slope  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

**Comments:**

Cocklebur, sedge, emergent grasses  
Lg cobble

**Floodplain unit:** ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: T1-RR-LFC

**Characteristics of the floodplain unit:**

Average sediment texture: cobble

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

Community successional stage:

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

**Indicators:**

- ☐ Mudcracks  
☐ Ripples  
☐ Drift and/or debris  
☐ Presence of bed and bank  
☒ Benches

- ☐ Soil development  
☒ Surface relief  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

**Comments:**

Low flow channel underwater @ time of survey, photos from low water levels included to show LFC

Project ID: 18-019 Cross section ID: T1-RR Date: 1-7-2020 Time:

**Floodplain unit:** ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: T1-RR-AFP

**Characteristics of the floodplain unit:**

Average sediment texture: pebbles/cobble

Total veg cover: 65 % Tree: 30 % Shrub: 30 % Herb: 5 %

Community successional stage:

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

**Indicators:**

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

**Comments:**

AFP is very active during winter, small riparian wetland area w/in AFP (dock/willow)

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: T1-RR-LT

**Characteristics of the floodplain unit:**

Average sediment texture: very fine sand → coarse sand

Total veg cover: 95 % Tree: 35 % Shrub: 45 % Herb: 15 %

Community successional stage:

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

**Indicators:**

- ☐ Mudcracks ☒ Soil development  
☐ Ripples ☒ Surface relief  
☐ Drift and/or debris ☒ Other: vegetation displacement  
☐ Presence of bed and bank ☐ Other: \_\_\_\_\_  
☐ Benches ☐ Other: \_\_\_\_\_

**Comments:**

Oaks + other large trees in the LT, soil is mud, very fine sand, coarse sand. Lots of underbrush & emergents dispersed

# Arid West Ephemeral and Intermittent Streams OHW M Datasheet

TI-RL

LF = Blue

OHWM = green

LT = Red

OX = orange

<b>Project:</b> 18-019 <b>Project Number:</b> Parrot - Pheon Restoration <b>Stream:</b> Butte Creek <b>Investigator(s):</b> CSW, ADA, JBS, BST, TDA	<b>Date:</b> 1-7-2020 <b>Town:</b> Chico <b>Photo begin file#:</b> <b>Time:</b> 0930 <b>State:</b> CA <b>Photo end file#:</b>
--	--

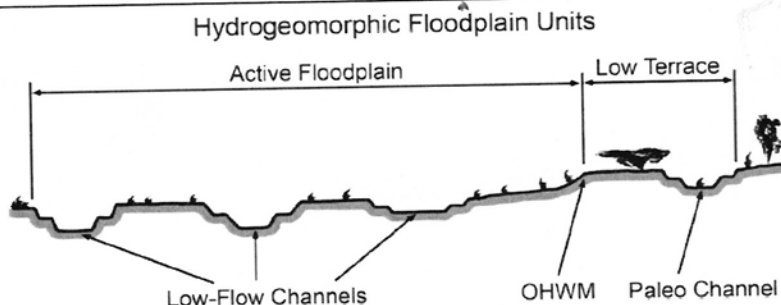
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?  Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?	<b>Location Details:</b> off of Honey Run Rd S.E. of Chico <b>Projection:</b> Transverse Mercator <b>Datum:</b> NAD 83 <b>Coordinates:</b> 39°42'30.5 N / 121°45'04.02 W
--	---

**Potential anthropogenic influences on the channel system:**  
 gravel removal/man made rock bar, development w/in area,  
 storm water run off from Camp Fire scar

**Brief site description:**  
 down stream end of lower man made gravel bar across river

**Checklist of resources (if available):**

<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input checked="" type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event
---	---



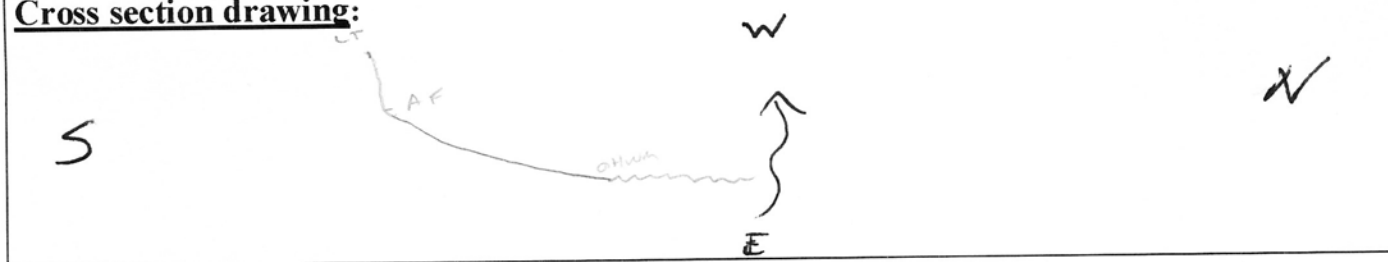
## Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

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

<input checked="" type="checkbox"/> Mapping on aerial photograph	<input checked="" type="checkbox"/> GPS
<input checked="" type="checkbox"/> Digitized on computer	<input type="checkbox"/> Other: surveyed topo

Project ID: 18-019 Cross section ID: T1-RL Date: 1/7/2020 Time: 0930

Cross section drawing:



OHWM

GPS point: T1-RL-OHWM

**Indicators:**

- ☒ Change in average sediment texture  
☐ Change in vegetation species  
☐ Change in vegetation cover

- ☐ Break in bank slope  
☒ Other: staining on rocks  
☐ Other: \_\_\_\_\_

**Comments:**

**Floodplain unit:** ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: T1-RL-LFC

**Characteristics of the floodplain unit:**

Average sediment texture: cobble

Total veg cover: 0 % Tree: \_\_\_\_\_ % Shrub: \_\_\_\_\_ % Herb: \_\_\_\_\_ %

Community successional stage:

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

**Indicators:**

- ☐ Mudcracks  
☐ Ripples  
☐ Drift and/or debris  
☐ Presence of bed and bank  
☐ Benches

- ☐ Soil development  
☐ Surface relief  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

**Comments:**

low flow channel under water @ time of survey

Project ID: 18-019 Cross section ID: T1-RL Date: 1/7/2020 Time: 0930

**Floodplain unit:** ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: T1-RL-AEP

**Characteristics of the floodplain unit:**

Average sediment texture: cobble

Total veg cover: 5 % Tree: 0 % Shrub: 0 % Herb: 5 %

Community successional stage:

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

**Indicators:**

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

Comments:

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: T1-RL-LT

**Characteristics of the floodplain unit:**

Average sediment texture: cobble

Total veg cover: 60 % Tree: 5 % Shrub: 5 % Herb: 50 %

Community successional stage:

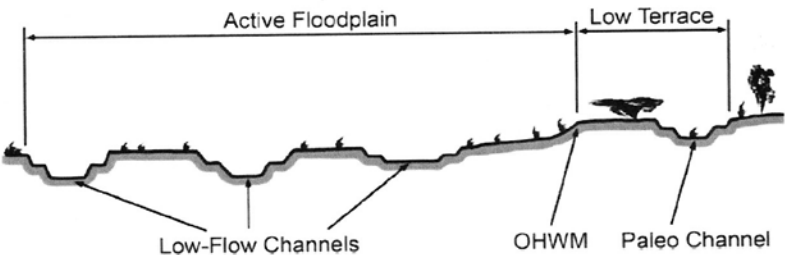
- ☐ NA ☒ Mid (herbaceous, shrubs, saplings)  
☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

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

Comments:

## Arid West Ephemeral and Intermittent Streams OHW M Datasheet

<b>Project:</b> Parrot-Phelan Restoration <b>Project Number:</b> 18-019 <b>Stream:</b> Butte Creek <b>Investigator(s):</b> CSU, ADH, J S, BSA, T DA		<b>Date:</b> 1-7-2020 <b>Town:</b> Chico <b>Photo begin file#:</b> <b>Time:</b> 0945 <b>State:</b> CA <b>Photo end file#:</b>					
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?  Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?		<b>Location Details:</b> off Honey Run Rd. S.E of Chico <b>Projection:</b> Transverse Mercator <b>Datum:</b> NAD83 10N <b>Coordinates:</b> 39°42'31.42 N / 121°45'02.74 W					
<b>Potential anthropogenic influences on the channel system:</b> Development in area, gravel removal, potential pollution storm water run-off from Camp Fire burn scar							
<b>Brief site description:</b> shallow riffles in channel, rock bar							
<b>Checklist of resources (if available):</b> <table style="width: 100%; border: none;"> <tr> <td style="vertical-align: top; width: 50%;"> <input checked="" type="checkbox"/> Aerial photography            Dates: 1-7-2020  <input checked="" type="checkbox"/> Topographic maps  <input type="checkbox"/> Geologic maps  <input type="checkbox"/> Vegetation maps  <input checked="" type="checkbox"/> Soils maps  <input type="checkbox"/> Rainfall/precipitation maps  <input type="checkbox"/> Existing delineation(s) for site  <input type="checkbox"/> Global positioning system (GPS)  <input type="checkbox"/> Other studies         </td> <td style="vertical-align: top; width: 50%;"> <input type="checkbox"/> Stream gage data            Gage number:            Period of record:  <input type="checkbox"/> History of recent effective discharges  <input type="checkbox"/> Results of flood frequency analysis  <input type="checkbox"/> Most recent shift-adjusted rating  <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event         </td> </tr> </table>				<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event		
<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event						
<b>Hydrogeomorphic Floodplain Units</b> 							
<b>Procedure for identifying and characterizing the floodplain units to assist in identifying the OHW M:</b> <ol style="list-style-type: none"> <li>1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.</li> <li>2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.</li> <li>3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.           <ol style="list-style-type: none"> <li>a) Record the floodplain unit and GPS position.</li> <li>b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.</li> <li>c) Identify any indicators present at the location.</li> </ol> </li> <li>4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.</li> <li>5. Identify the OHW M and record the indicators. Record the OHW M position via:           <table style="width: 100%; border: none; margin-top: 5px;"> <tr> <td style="width: 50%;"><input checked="" type="checkbox"/> Mapping on aerial photograph</td> <td style="width: 50%;"><input checked="" type="checkbox"/> GPS</td> </tr> <tr> <td><input checked="" type="checkbox"/> Digitized on computer</td> <td><input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)</td> </tr> </table> </li> </ol>				<input checked="" type="checkbox"/> Mapping on aerial photograph	<input checked="" type="checkbox"/> GPS	<input checked="" type="checkbox"/> Digitized on computer	<input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)
<input checked="" type="checkbox"/> Mapping on aerial photograph	<input checked="" type="checkbox"/> GPS						
<input checked="" type="checkbox"/> Digitized on computer	<input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)						



**Cross section drawing:**



AEP

0 Нвн

E

5

W LFC

GPS point: T2-RR-0142m

☒ Change in average sediment texture  
☒ Change in vegetation species  
☒ Change in vegetation cover

- ☒ Break in bank slope  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

**Comments:**

lg cobble  $\rightarrow$  small boulder  
rush + emergent grasses (10%) veg cover

**Floodplain unit:**

- ☒
- Low-Flow Channel
- ☐
- Active Floodplain
- ☐
- Low Terrace

GPS point: T 2-RR - LFC

Average sediment texture: small boulder/cobble

Total veg cover: 0 % Tree: 1 % Shrub: 1 % Herb: 1 %

Community successional stage:

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

### Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches

- ☐ Soil development  
☒ Surface relief  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

**Comments:**

Project ID: 18-019 Cross section ID: T2-RR Date: 1-7-2020 Time: 0950

**Floodplain unit:** ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: T2-RR-AFP

**Characteristics of the floodplain unit:**

Average sediment texture: pebbles & cobbles

Total veg cover: 25 % Tree: 0 % Shrub: 5 % Herb: 25 %

Community successional stage:

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> NA                  | <input type="checkbox"/> Mid (herbaceous, shrubs, saplings)      |
| <input type="checkbox"/> Early (herbaceous & seedlings) | <input type="checkbox"/> Late (herbaceous, shrubs, mature trees) |

**Indicators:**

- |  |  |
|--|--|
| <input type="checkbox"/> Mudcracks                           | <input checked="" type="checkbox"/> Soil development |
| <input type="checkbox"/> Ripples                             | <input checked="" type="checkbox"/> Surface relief   |
| <input checked="" type="checkbox"/> Drift and/or debris      | <input type="checkbox"/> Other: _____                |
| <input checked="" type="checkbox"/> Presence of bed and bank | <input type="checkbox"/> Other: _____                |
| <input type="checkbox"/> Benches                             | <input type="checkbox"/> Other: _____                |

Comments:

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: T2-RR-LT

**Characteristics of the floodplain unit:**

Average sediment texture: very coarse sand - pebbles

Total veg cover: 85 % Tree: 35 % Shrub: 20 % Herb: 30 %

Community successional stage:

- |  |   |
|--|---|
| <input type="checkbox"/> NA  | <input checked="" type="checkbox"/> Mid (herbaceous, shrubs, saplings)      |
| <input checked="" type="checkbox"/> Early (herbaceous & seedlings) | <input checked="" type="checkbox"/> Late (herbaceous, shrubs, mature trees) |

**Indicators:**

- |   |  |
|---|--|
| <input type="checkbox"/> Mudcracks                | <input checked="" type="checkbox"/> Soil development               |
| <input type="checkbox"/> Ripples                  | <input type="checkbox"/> Surface relief                            |
| <input type="checkbox"/> Drift and/or debris      | <input checked="" type="checkbox"/> Other: <u>vegetation depth</u> |
| <input type="checkbox"/> Presence of bed and bank | <input type="checkbox"/> Other: _____                              |
| <input type="checkbox"/> Benches                  | <input type="checkbox"/> Other: _____                              |

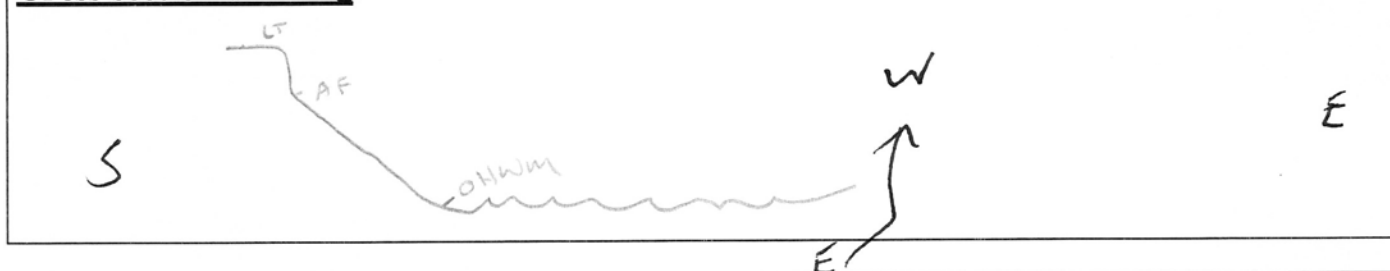
Comments:

## Arid West Ephemeral and Intermittent Streams OHW M Datasheet

<b>Project:</b> Parrot-Phelan Restoration <b>Project Number:</b> 18-019 <b>Stream:</b> Butte Creek <b>Investigator(s):</b> CSW, ADA, SBS, BSA, TDA		<b>Date:</b> 1-7-2020 <b>Town:</b> Chico <b>Photo begin file#:</b> <b>Time:</b> 0945 <b>State:</b> CA <b>Photo end file#:</b>	
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?  Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?		<b>Location Details:</b> off Honey Run Rd. S.E. of Chico <b>Projection:</b> Transverse Mercator <b>Datum:</b> NAD83 10N <b>Coordinates:</b> 39°42'31.42" N 121°45'02.74" W	
<b>Potential anthropogenic influences on the channel system:</b> Development in area, gravel removal, potential pollution storm water run-off from Camp Fire burn scar			
<b>Brief site description:</b> shallow ripples in channel, rock bar across channel			
<b>Checklist of resources (if available):</b> <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <input checked="" type="checkbox"/> Aerial photography            Dates: 1-7-2020  <input checked="" type="checkbox"/> Topographic maps  <input type="checkbox"/> Geologic maps  <input type="checkbox"/> Vegetation maps  <input checked="" type="checkbox"/> Soils maps  <input type="checkbox"/> Rainfall/precipitation maps  <input type="checkbox"/> Existing delineation(s) for site  <input checked="" type="checkbox"/> Global positioning system (GPS)  <input type="checkbox"/> Other studies         </div> <div style="width: 50%;"> <input type="checkbox"/> Stream gage data            Gage number:            Period of record:  <input type="checkbox"/> History of recent effective discharges  <input type="checkbox"/> Results of flood frequency analysis  <input type="checkbox"/> Most recent shift-adjusted rating  <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event         </div> </div>			
<b>Hydrogeomorphic Floodplain Units</b>			
<b>Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:</b> <ol style="list-style-type: none"> <li>1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.</li> <li>2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.</li> <li>3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.           <ol style="list-style-type: none"> <li>a) Record the floodplain unit and GPS position.</li> <li>b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.</li> <li>c) Identify any indicators present at the location.</li> </ol> </li> <li>4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.</li> <li>5. Identify the OHWM and record the indicators. Record the OHWM position via:           <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div> <input checked="" type="checkbox"/> Mapping on aerial photograph  <input checked="" type="checkbox"/> Digitized on computer           </div> <div> <input checked="" type="checkbox"/> GPS  <input checked="" type="checkbox"/> Other: Surveyed topo (11/1/2018)           </div> </div> </li> </ol>			

Project ID: 13-019 Cross section ID: T2-RL Date: 1/7/2020 Time: 0945

**Cross section drawing:**



**OHWM**

GPS point: T2-RL OHWM

**Indicators:**

- ☐ Change in average sediment texture
- ☐ Change in vegetation species
- ☐ Change in vegetation cover

☐ Break in bank slope

☒ Other: water

☒ Other: ringing/staining

**Comments:**

**Floodplain unit:**

☒ Low-Flow Channel

☐ Active Floodplain

☐ Low Terrace

GPS point: T2-RL-LFC

**Characteristics of the floodplain unit:**

Average sediment texture: cobble/boulder

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

Community successional stage:

☒ NA

☐ Early (herbaceous & seedlings)

☐ Mid (herbaceous, shrubs, saplings)

☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

☐ Mudcracks

☐ Ripples

☐ Drift and/or debris

☐ Presence of bed and bank

☐ Benches

☐ Soil development

☐ Surface relief

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

**Comments:**

low flow channel under water @ time of survey

Project ID: 18-019 Cross section ID: T2-RL Date: 1/7/2020 Time: 0945

**Floodplain unit:** ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: T2-RL-AFP

**Characteristics of the floodplain unit:**

Average sediment texture: COBBLE

Total veg cover: 5 % Tree: 0 % Shrub: 0 % Herb: 5 %

Community successional stage:

- |  |  |
|--|--|
| <input type="checkbox"/> NA  | <input type="checkbox"/> Mid (herbaceous, shrubs, saplings)      |
| <input checked="" type="checkbox"/> Early (herbaceous & seedlings) | <input type="checkbox"/> Late (herbaceous, shrubs, mature trees) |

**Indicators:**

- |   |   |
|---|---|
| <input type="checkbox"/> Mudcracks                | <input type="checkbox"/> Soil development |
| <input type="checkbox"/> Ripples                  | <input type="checkbox"/> Surface relief   |
| <input type="checkbox"/> Drift and/or debris      | <input type="checkbox"/> Other: _____     |
| <input type="checkbox"/> Presence of bed and bank | <input type="checkbox"/> Other: _____     |
| <input checked="" type="checkbox"/> Benches       | <input type="checkbox"/> Other: _____     |

Comments:

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: T2-RL-LT

**Characteristics of the floodplain unit:**

Average sediment texture: SILT/FINE SAND

Total veg cover: 50 % Tree: 0 % Shrub: 5 % Herb: 50 %

Community successional stage:

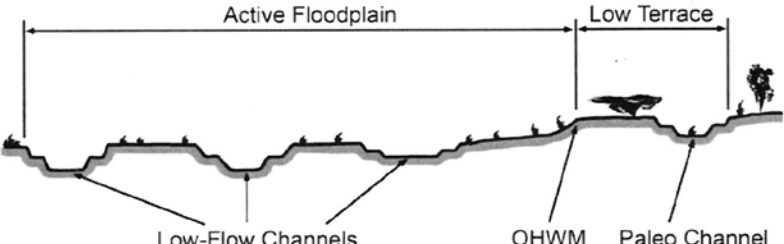
- |  |  |
|--|--|
| <input type="checkbox"/> NA  | <input type="checkbox"/> Mid (herbaceous, shrubs, saplings)      |
| <input checked="" type="checkbox"/> Early (herbaceous & seedlings) | <input type="checkbox"/> Late (herbaceous, shrubs, mature trees) |

**Indicators:**

- |   |   |
|---|---|
| <input type="checkbox"/> Mudcracks                | <input checked="" type="checkbox"/> Soil development          |
| <input type="checkbox"/> Ripples                  | <input type="checkbox"/> Surface relief                       |
| <input type="checkbox"/> Drift and/or debris      | <input checked="" type="checkbox"/> Other: <u>veg. change</u> |
| <input type="checkbox"/> Presence of bed and bank | <input type="checkbox"/> Other: _____                         |
| <input checked="" type="checkbox"/> Benches       | <input type="checkbox"/> Other: _____                         |

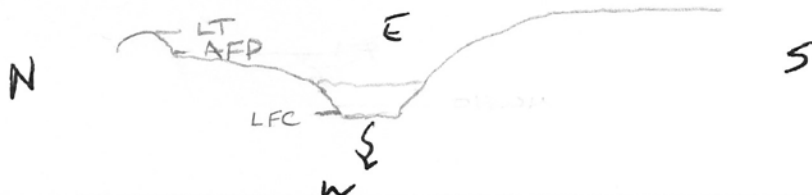
Comments:

## Arid West Ephemeral and Intermittent Streams OWHM Datasheet

<b>Project:</b> Parrot-Phelan Restoration <b>Project Number:</b> 18-019 <b>Stream:</b> Butte Creek <b>Investigator(s):</b> CSW, ADH, JS, BSA, TDA		<b>Date:</b> 1-7-2020 <b>Town:</b> Chico <b>Photo begin file#:</b> <b>Time:</b> 0959 <b>State:</b> CA <b>Photo end file#:</b>			
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?  Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?		<b>Location Details:</b> off Honey Run Rd. S.E. of Chico <b>Projection:</b> Transverse Mercator <b>Datum:</b> NAD83 <b>10N</b> <b>Coordinates:</b> 39°42'32.77"N / 121°45'01.63"W			
<b>Potential anthropogenic influences on the channel system:</b> potential pollution, development in area, grave removal					
<b>Brief site description:</b> ~ 2' deep w/ small riffles in river					
<b>Checklist of resources (if available):</b> <table style="width: 100%; border: none;"> <tr> <td style="vertical-align: top; width: 50%;"> <input checked="" type="checkbox"/> Aerial photography            Dates: 1-7-2020  <input checked="" type="checkbox"/> Topographic maps  <input type="checkbox"/> Geologic maps  <input type="checkbox"/> Vegetation maps  <input checked="" type="checkbox"/> Soils maps  <input type="checkbox"/> Rainfall/precipitation maps  <input type="checkbox"/> Existing delineation(s) for site  <input checked="" type="checkbox"/> Global positioning system (GPS)  <input type="checkbox"/> Other studies         </td> <td style="vertical-align: top; width: 50%;"> <input type="checkbox"/> Stream gage data            Gage number:            Period of record:  <input type="checkbox"/> History of recent effective discharges  <input type="checkbox"/> Results of flood frequency analysis  <input type="checkbox"/> Most recent shift-adjusted rating  <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event         </td> </tr> </table>				<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input checked="" type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event
<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input checked="" type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event				
<b>Hydrogeomorphic Floodplain Units</b> 					
<b>Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:</b> <ol style="list-style-type: none"> <li>1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.</li> <li>2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.</li> <li>3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.           <ol style="list-style-type: none"> <li>a) Record the floodplain unit and GPS position.</li> <li>b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.</li> <li>c) Identify any indicators present at the location.</li> </ol> </li> <li>4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.</li> <li>5. Identify the OHWM and record the indicators. Record the OHWM position via:           <table style="width: 100%; border: none; margin-top: 5px;"> <tr> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Mapping on aerial photograph  <input checked="" type="checkbox"/> Digitized on computer           </td> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> GPS  <input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)           </td> </tr> </table> </li> </ol>				<input checked="" type="checkbox"/> Mapping on aerial photograph <input checked="" type="checkbox"/> Digitized on computer	<input checked="" type="checkbox"/> GPS <input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)
<input checked="" type="checkbox"/> Mapping on aerial photograph <input checked="" type="checkbox"/> Digitized on computer	<input checked="" type="checkbox"/> GPS <input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)				

Project ID: 18-019 Cross section ID: T3-RR Date: 1-7-2020 Time: 0959

**Cross section drawing:**



**OHW**

GPS point: T3-RR-OHW

**Indicators:**

- ☐ Change in average sediment texture
- ☐ Change in vegetation species
- ☐ Change in vegetation cover

- ☒ Break in bank slope
- ☐ Other: \_\_\_\_\_
- ☐ Other: \_\_\_\_\_

**Comments:**

At edge of steep cobble bank from fill of upstream extraction material.

**Floodplain unit:** ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: T3-RR-LFC

**Characteristics of the floodplain unit:**

Average sediment texture: Cobble (1"-3")

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

Community successional stage:

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

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☒ Benches

- ☐ Soil development
- ☒ Surface relief
- ☐ Other: \_\_\_\_\_
- ☐ Other: \_\_\_\_\_
- ☐ Other: \_\_\_\_\_

**Comments:**

Water is at OHWM during field visit. LFC is submerged but definable by channel.



Project ID: 18-019 Cross section ID: T3-RR Date: 1-7-2020 Time: 0959

**Floodplain unit:** ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: T3-RR-AFP

**Characteristics of the floodplain unit:**

Average sediment texture: Cobble (3"-9")

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

Community successional stage:

☒ NA

☐ Early (herbaceous & seedlings)

☐ Mid (herbaceous, shrubs, saplings)

☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

☐ Mudcracks

☐ Ripples

☐ Drift and/or debris

☒ Presence of bed and bank

☐ Benches

☐ Soil development

☐ Surface relief

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

**Comments:**

AFP is composed of large cobble deposited from upstream extraction site.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: T3-RR-LT

**Characteristics of the floodplain unit:**

Average sediment texture: Cobble (3"-9")

Total veg cover: 50 % Tree: 10 % Shrub: 0 % Herb: 90 %

Community successional stage:

☐ NA

☐ Early (herbaceous & seedlings)

☐ Mid (herbaceous, shrubs, saplings)

☒ Late (herbaceous, shrubs, mature trees)

**Indicators:**

☐ Mudcracks

☐ Ripples

☐ Drift and/or debris

☒ Presence of bed and bank

☒ Benches

☐ Soil development

☐ Surface relief

☐ Other: \_\_\_\_\_

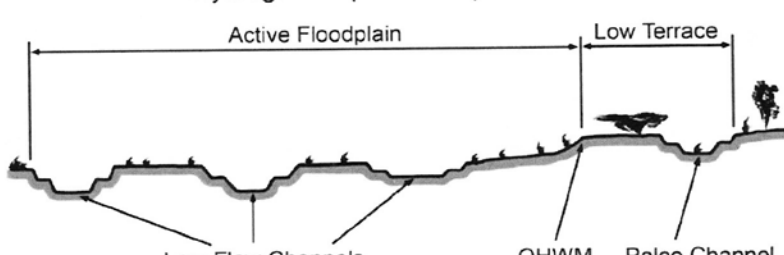
☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

**Comments:**

LT forms where cobble deposit meets the naturally sloping bank of the creek.

## Arid West Ephemeral and Intermittent Streams OWHM Datasheet

<b>Project:</b> Parrot-Pheasant Restoration <b>Project Number:</b> 18-019 <b>Stream:</b> Butte Creek <b>Investigator(s):</b> CJSW, ADH, JBS, BSA		<b>Date:</b> 1-7-2020 <b>Town:</b> Chico <b>Photo begin file#:</b>		<b>Time:</b> 0959 <b>State:</b> CA <b>Photo end file#:</b>					
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?		<b>Location Details:</b> off Honey Run Rd. S.E. of Chico							
Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?		<b>Projection:</b> Transverse Mercator <b>Datum:</b> NAD 83 10N <b>Coordinates:</b> 39°42'32.77"N / 121°45'01.63"W							
<b>Potential anthropogenic influences on the channel system:</b> rock bar across channel, Development in area, potential pollution run-off from Camp Fire burn scar									
<b>Brief site description:</b> ~ 2' deep and small riffles									
<b>Checklist of resources (if available):</b> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Aerial photography            Dates: 1-7-2020  <input checked="" type="checkbox"/> Topographic maps  <input type="checkbox"/> Geologic maps  <input type="checkbox"/> Vegetation maps  <input checked="" type="checkbox"/> Soils maps  <input type="checkbox"/> Rainfall/precipitation maps  <input type="checkbox"/> Existing delineation(s) for site  <input checked="" type="checkbox"/> Global positioning system (GPS)  <input type="checkbox"/> Other studies         </td> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Stream gage data            Gage number:            Period of record:  <input type="checkbox"/> History of recent effective discharges  <input type="checkbox"/> Results of flood frequency analysis  <input type="checkbox"/> Most recent shift-adjusted rating  <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event         </td> </tr> </table>						<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input checked="" type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event		
<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input checked="" type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event								
<b>Hydrogeomorphic Floodplain Units</b> 									
<b>Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:</b> <ol style="list-style-type: none"> <li>1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.</li> <li>2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.</li> <li>3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.           <ol style="list-style-type: none"> <li>a) Record the floodplain unit and GPS position.</li> <li>b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.</li> <li>c) Identify any indicators present at the location.</li> </ol> </li> <li>4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.</li> <li>5. Identify the OHWM and record the indicators. Record the OHWM position via:           <table style="width: 100%; border: none; margin-top: 5px;"> <tr> <td style="width: 50%;"><input checked="" type="checkbox"/> Mapping on aerial photograph</td> <td style="width: 50%;"><input checked="" type="checkbox"/> GPS</td> </tr> <tr> <td><input checked="" type="checkbox"/> Digitized on computer</td> <td><input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)</td> </tr> </table> </li> </ol>						<input checked="" type="checkbox"/> Mapping on aerial photograph	<input checked="" type="checkbox"/> GPS	<input checked="" type="checkbox"/> Digitized on computer	<input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)
<input checked="" type="checkbox"/> Mapping on aerial photograph	<input checked="" type="checkbox"/> GPS								
<input checked="" type="checkbox"/> Digitized on computer	<input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)								

Project ID: 18-019

Cross section ID: T3-RL

Date: 1/7/2020 Time: 0959

**Cross section drawing:**



**OHWM**

GPS point: T3-RL-OHWM

**Indicators:**

- ☒ Change in average sediment texture  
☐ Change in vegetation species  
☐ Change in vegetation cover

- ☐ Break in bank slope  
☒ Other: water staining  
☐ Other:

**Comments:**

**Floodplain unit:** ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: T3-RL-LFC

**Characteristics of the floodplain unit:**

Average sediment texture: cobble

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

Community successional stage:

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

**Indicators:**

- ☐ Mudcracks  
☐ Ripples  
☐ Drift and/or debris  
☐ Presence of bed and bank  
☐ Benches

- ☐ Soil development  
☐ Surface relief  
☐ Other:  
☐ Other:  
☐ Other:

**Comments:**

low flow channel under water @ time of survey

Project ID: 18-019 Cross section ID: T3-RL Date: 1/7/2020 Time: 0959

**Floodplain unit:** ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: T3-RL-AFP

**Characteristics of the floodplain unit:**

Average sediment texture: COBBLE

Total veg cover: 10 % Tree: 2 % Shrub: 2 % Herb: 6 %

Community successional stage:

☐ NA

☒ Early (herbaceous & seedlings)

☐ Mid (herbaceous, shrubs, saplings)

☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

☐ Mudcracks

☐ Ripples

☐ Drift and/or debris

☐ Presence of bed and bank

☒ Benches

☐ Soil development

☐ Surface relief

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

**Comments:**

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: T3-RL-LT

**Characteristics of the floodplain unit:**

Average sediment texture: SOIL + COBBLE

Total veg cover: 70 % Tree: 5 % Shrub: 5 % Herb: 60 %

Community successional stage:

☐ NA

☒ Early (herbaceous & seedlings)

☒ Mid (herbaceous, shrubs, saplings)

☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

☐ Mudcracks

☐ Ripples

☐ Drift and/or debris

☐ Presence of bed and bank

☒ Benches

☒ Soil development

☐ Surface relief

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

**Comments:**

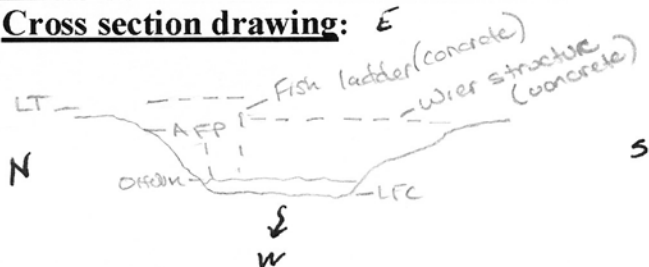
## Arid West Ephemeral and Intermittent Streams OWHM Datasheet

<b>Project:</b> Parrot-Phelan Restoration <b>Project Number:</b> 18-019 <b>Stream:</b> Bu He Creek <b>Investigator(s):</b> CFW, ADH, J S, BSA, TDA		<b>Date:</b> 1-7-2020 <b>Town:</b> Chico <b>Photo begin file#:</b> <b>Time:</b> 1010 <b>State:</b> CA <b>Photo end file#:</b>			
Y <input type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?  Y <input type="checkbox"/> / N <input type="checkbox"/> Is the site significantly disturbed?		<b>Location Details:</b> off Honey Run Rd. S.E. of Chico <b>Projection:</b> Transverse Mercator <b>Datum:</b> NAD 83 <b>Coordinates:</b> 39°42'33.16"N / 121°45'01.17"W			
<b>Potential anthropogenic influences on the channel system:</b> Wier and fish ladder for M&T diversion. (bottom/downstream) run-off from Camp Fire burn scar					
<b>Brief site description:</b> immediately down stream of wier					
<b>Checklist of resources (if available):</b> <table style="width: 100%; border: none;"> <tr> <td style="vertical-align: top; width: 50%;"> <input checked="" type="checkbox"/> Aerial photography            Dates: 1-7-2020  <input checked="" type="checkbox"/> Topographic maps  <input type="checkbox"/> Geologic maps  <input type="checkbox"/> Vegetation maps  <input checked="" type="checkbox"/> Soils maps  <input type="checkbox"/> Rainfall/precipitation maps  <input type="checkbox"/> Existing delineation(s) for site  <input checked="" type="checkbox"/> Global positioning system (GPS)  <input type="checkbox"/> Other studies         </td> <td style="vertical-align: top; width: 50%;"> <input type="checkbox"/> Stream gage data            Gage number:            Period of record:  <input type="checkbox"/> History of recent effective discharges  <input type="checkbox"/> Results of flood frequency analysis  <input type="checkbox"/> Most recent shift-adjusted rating  <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event         </td> </tr> </table>				<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input checked="" type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event
<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input checked="" type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event				
<b>Hydrogeomorphic Floodplain Units</b> 					
<b>Procedure for identifying and characterizing the floodplain units to assist in identifying the OWHM:</b> <ol style="list-style-type: none"> <li>1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.</li> <li>2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.</li> <li>3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.           <ol style="list-style-type: none"> <li>a) Record the floodplain unit and GPS position.</li> <li>b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.</li> <li>c) Identify any indicators present at the location.</li> </ol> </li> <li>4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.</li> <li>5. Identify the OWHM and record the indicators. Record the OWHM position via:           <table style="width: 100%; border: none; margin-top: 5px;"> <tr> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Mapping on aerial photograph  <input checked="" type="checkbox"/> Digitized on computer           </td> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> GPS  <input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)           </td> </tr> </table> </li> </ol>				<input checked="" type="checkbox"/> Mapping on aerial photograph <input checked="" type="checkbox"/> Digitized on computer	<input checked="" type="checkbox"/> GPS <input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)
<input checked="" type="checkbox"/> Mapping on aerial photograph <input checked="" type="checkbox"/> Digitized on computer	<input checked="" type="checkbox"/> GPS <input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)				

Project ID: 18-019

Cross section ID: T4-RR

Date: 1-7-2020 Time: 1015

**Cross section drawing:** E**OHWM**

GPS point: T4-RR-OHWM

**Indicators:**

- ☒ Change in average sediment texture  
☐ Change in vegetation species  
☐ Change in vegetation cover

- ☒ Break in bank slope  
☒ Other: Staining on concrete structure.  
☐ Other:

**Comments:**

At bottom of fish ladder and wier structure. A large eddy has developed and cut the bank back in this area. No fill material in this cut so bank is steeper than normal. Bathtub ring water staining on fish ladder shows OHWM.

**Floodplain unit:**☒ Low-Flow Channel☐ Active Floodplain☐ Low Terrace

GPS point: T4-RR-LFC

**Characteristics of the floodplain unit:**

Average sediment texture: Cobble (3"-6")

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

Community successional stage:

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

**Indicators:**

- ☐ Mudcracks  
☐ Ripples  
☐ Drift and/or debris  
☒ Presence of bed and bank  
☒ Benches

- ☐ Soil development  
☐ Surface relief  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

**Comments:**

LFC was submerged during field visit, but channel and thalweg are apparent.

Project ID: 18-019 Cross section ID: T4-RR Date: 1-7-2020 Time: 1015

**Floodplain unit:** ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: T4-RR-AFP

**Characteristics of the floodplain unit:**

Average sediment texture: Sand and Cobble (1-3")  
Total veg cover: 75 % Tree: 10 % Shrub: 70 % Herb: 20 %

Community successional stage:

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

**Indicators:**

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

**Comments:**

Steep floodplain bank is apparent with veg signature and woody debris from eddy at high flow. Bathtub ring water staining on concrete structure shows channel edge

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: T4-RR-LT

**Characteristics of the floodplain unit:**

Average sediment texture: Fine  
Total veg cover: 100 % Tree: 5 % Shrub: 10 % Herb: 85 %

Community successional stage:

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

**Indicators:**

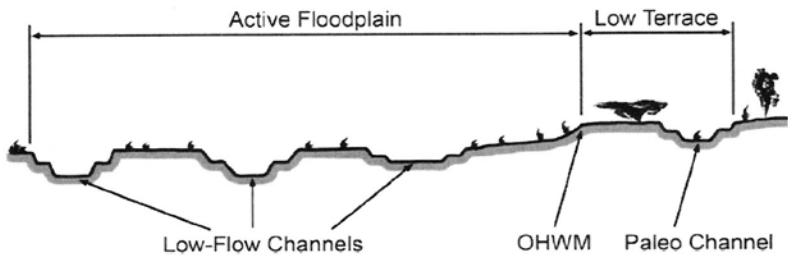
- ☐ Mudcracks ☐ Soil development  
☐ Ripples ☐ Surface relief  
☐ Drift and/or debris ☐ Other: \_\_\_\_\_  
☒ Presence of bed and bank ☐ Other: \_\_\_\_\_  
☒ Benches ☐ Other: \_\_\_\_\_

**Comments:**

Top of bank/levee has obvious veg and debris changes. Covered in grasses.

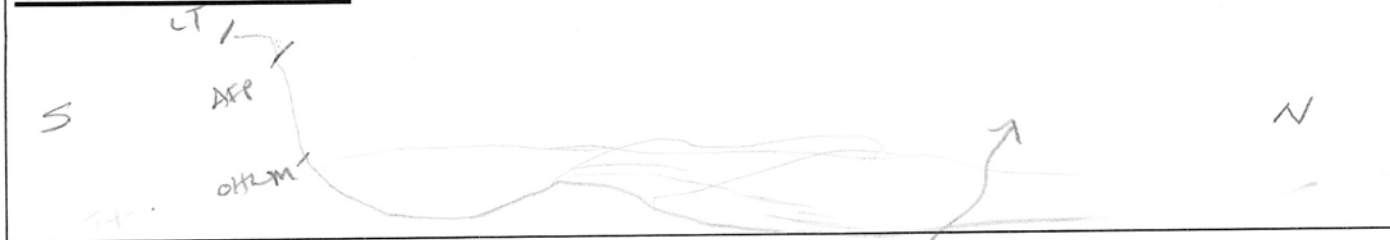


## Arid West Ephemeral and Intermittent Streams OHW M Datasheet

<b>Project:</b> Parrot-Phelan Restoration <b>Project Number:</b> 18-019 <b>Stream:</b> Butte Creek <b>Investigator(s):</b> CSW, ADH	<b>Date:</b> 1-7-2020 <b>Town:</b> Chico <b>Photo begin file#:</b> <b>Time:</b> 1010 <b>State:</b> CA <b>Photo end file#:</b>
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?  Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?	<b>Location Details:</b> off Honey Run Rd S.E. of Chico <b>Projection:</b> Transverse Mercator <b>Datum:</b> NAD83 10N <b>Coordinates:</b> 39°42'33.16"N / 121°45'01.17"W
<b>Potential anthropogenic influences on the channel system:</b> Wier & fish ladder, potential pollution, development run-off from Camp Fire burn scar	
<b>Brief site description:</b> immediately down stream of dam, deep part of channel	
<b>Checklist of resources (if available):</b> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <input checked="" type="checkbox"/> Aerial photography            Dates: 1-7-2020  <input checked="" type="checkbox"/> Topographic maps  <input type="checkbox"/> Geologic maps  <input type="checkbox"/> Vegetation maps  <input checked="" type="checkbox"/> Soils maps  <input type="checkbox"/> Rainfall/precipitation maps  <input type="checkbox"/> Existing delineation(s) for site  <input checked="" type="checkbox"/> Global positioning system (GPS)  <input type="checkbox"/> Other studies         </div> <div style="width: 45%;"> <input type="checkbox"/> Stream gage data            Gage number:            Period of record:  <input type="checkbox"/> History of recent effective discharges  <input type="checkbox"/> Results of flood frequency analysis  <input type="checkbox"/> Most recent shift-adjusted rating  <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event         </div> </div>	
<b>Hydrogeomorphic Floodplain Units</b> 	
<b>Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:</b> <ol style="list-style-type: none"> <li>1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.</li> <li>2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.</li> <li>3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.           <ol style="list-style-type: none"> <li>a) Record the floodplain unit and GPS position.</li> <li>b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.</li> <li>c) Identify any indicators present at the location.</li> </ol> </li> <li>4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.</li> <li>5. Identify the OHWM and record the indicators. Record the OHWM position via:           <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div> <input checked="" type="checkbox"/> Mapping on aerial photograph  <input checked="" type="checkbox"/> Digitized on computer           </div> <div> <input checked="" type="checkbox"/> GPS  <input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)           </div> </div> </li> </ol>	

Project ID: 18-019 Cross section ID: T4-RL Date: 1/7/2020 Time: 1010

**Cross section drawing:**



**OHWM**

GPS point: T4-RL-OHWM

**Indicators:**

- ☐ Change in average sediment texture
- ☐ Change in vegetation species
- ☐ Change in vegetation cover

- ☒ Break in bank slope
- ☒ Other: \_\_\_\_\_
- ☐ Other: \_\_\_\_\_

**Comments:**

**Floodplain unit:** ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: T4-RL-LFC

**Characteristics of the floodplain unit:**

Average sediment texture: coarse

Total veg cover: 0 % Tree: \_\_\_\_\_ % Shrub: \_\_\_\_\_ % Herb: \_\_\_\_\_ %

Community successional stage:

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

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches

- ☐ Soil development
- ☐ Surface relief
- ☐ Other: \_\_\_\_\_
- ☐ Other: \_\_\_\_\_
- ☐ Other: \_\_\_\_\_

**Comments:**

low flow channel under water @ time of survey.

Project ID: 13-019 Cross section ID: T4-RL Date: 1/7/2020 Time: 610

**Floodplain unit:** ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: T4-RL-AFP

**Characteristics of the floodplain unit:**

Average sediment texture: SOIL & COBBLE

Total veg cover: 70 % Tree: 5 % Shrub: 15 % Herb: 45 %

Community successional stage:

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

**Indicators:**

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

**Comments:**

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: T4-RL-LT

**Characteristics of the floodplain unit:**

Average sediment texture: SOIL & COBBLE

Total veg cover: 70 % Tree: 5 % Shrub: 10 % Herb: 55 %

Community successional stage:

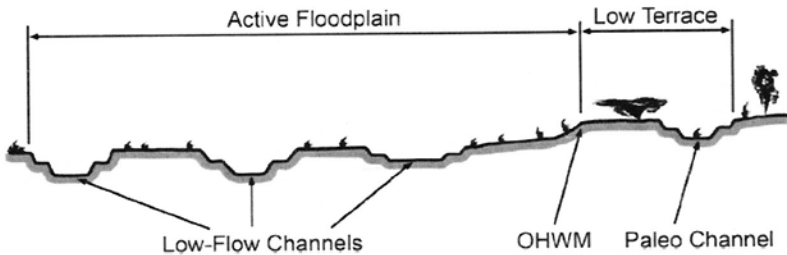
- ☐ NA ☒ Mid (herbaceous, shrubs, saplings)  
☐ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

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

**Comments:**

## Arid West Ephemeral and Intermittent Streams OHW M Datasheet

<b>Project:</b> Parrot-Phelan Restoration <b>Project Number:</b> 18-019 <b>Stream:</b> Bu He Creek <b>Investigator(s):</b> CSW, ADH, J S, BSA, TDA		<b>Date:</b> 1-7-2020 <b>Town:</b> Chico <b>Photo begin file#:</b> <b>Time:</b> 1027 <b>State:</b> CA <b>Photo end file#:</b>					
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?  Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?		<b>Location Details:</b> off Honey Run Rd. S.E. of Chico <b>Projection:</b> Transverse Mercator <b>Datum:</b> NAD 83 10N <b>Coordinates:</b> 39°42'36.51" N / 121°44'52.40" W (TS)					
<b>Potential anthropogenic influences on the channel system:</b> Wier and fish ladder for M&T diversion. (Top/Upstream) potential pollution, development, run-off from Camp Fire							
<b>Brief site description:</b> immediately upstream of wier.							
<b>Checklist of resources (if available):</b> <table style="width: 100%; border: none;"> <tr> <td style="vertical-align: top; width: 50%;"> <input checked="" type="checkbox"/> Aerial photography            Dates: 1-7-2020  <input checked="" type="checkbox"/> Topographic maps  <input type="checkbox"/> Geologic maps  <input type="checkbox"/> Vegetation maps  <input checked="" type="checkbox"/> Soils maps  <input type="checkbox"/> Rainfall/precipitation maps  <input type="checkbox"/> Existing delineation(s) for site  <input checked="" type="checkbox"/> Global positioning system (GPS)  <input type="checkbox"/> Other studies         </td> <td style="vertical-align: top; width: 50%;"> <input type="checkbox"/> Stream gage data            Gage number:            Period of record:  <input type="checkbox"/> History of recent effective discharges  <input type="checkbox"/> Results of flood frequency analysis  <input type="checkbox"/> Most recent shift-adjusted rating  <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event         </td> </tr> </table>				<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input checked="" type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event		
<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input checked="" type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event						
<b>Hydrogeomorphic Floodplain Units</b> 							
<b>Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:</b> <ol style="list-style-type: none"> <li>1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.</li> <li>2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.</li> <li>3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.           <ol style="list-style-type: none"> <li>a) Record the floodplain unit and GPS position.</li> <li>b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.</li> <li>c) Identify any indicators present at the location.</li> </ol> </li> <li>4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.</li> <li>5. Identify the OHWM and record the indicators. Record the OHWM position via:           <table style="width: 100%; border: none; margin-top: 5px;"> <tr> <td style="width: 50%;"><input checked="" type="checkbox"/> Mapping on aerial photograph</td> <td style="width: 50%;"><input checked="" type="checkbox"/> GPS</td> </tr> <tr> <td><input checked="" type="checkbox"/> Digitized on computer</td> <td><input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)</td> </tr> </table> </li> </ol>				<input checked="" type="checkbox"/> Mapping on aerial photograph	<input checked="" type="checkbox"/> GPS	<input checked="" type="checkbox"/> Digitized on computer	<input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)
<input checked="" type="checkbox"/> Mapping on aerial photograph	<input checked="" type="checkbox"/> GPS						
<input checked="" type="checkbox"/> Digitized on computer	<input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)						

Project ID: 18-019 Cross section ID: T5-RR Date: 1-7-2020 Time: 1027

**Cross section drawing:**



**OHWM**

GPS point: T5-RR-OHWM

**Indicators:**

- ☒ Change in average sediment texture  
☒ Change in vegetation species  
☒ Change in vegetation cover

- ☐ Break in bank slope  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

**Comments:** Bathtub water staining on concrete structure. Upstream of concrete weir and ladder structure representing normal bank conditions for this part of the creek. Large Rip Rap boulders in place.

**Floodplain unit:** ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: T5-RR-LFC

**Characteristics of the floodplain unit:**

Average sediment texture: \_\_\_\_\_

Total veg cover: 0% Tree: \_\_\_\_\_% Shrub: \_\_\_\_\_% Herb: \_\_\_\_\_%

Community successional stage:

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

**Indicators:**

- ☐ Mudcracks  
☒ Ripples  
☐ Drift and/or debris  
☐ Presence of bed and bank  
☐ Benches

- ☐ Soil development  
☐ Surface relief  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

**Comments:**

LFC was submerged during visit. Upstream of the weir sediment has accumulated across the face of the weir structure evenly. A slight channel and thalweg are apparent in the middle of the water course.

Project ID: 18-019 Cross section ID: T5-RR Date: 1-7-2020 Time: 1027

**Floodplain unit:** ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: T5-RR-AFP

**Characteristics of the floodplain unit:**

Average sediment texture: Fine sand and large riprap boulders

Total veg cover: 50 % Tree: 10 % Shrub: 0 % Herb: 90 %

Community successional stage:

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

**Indicators:**

- |   |   |
|---|---|
| <input type="checkbox"/> Mudcracks                      | <input type="checkbox"/> Soil development |
| <input type="checkbox"/> Ripples                        | <input type="checkbox"/> Surface relief   |
| <input checked="" type="checkbox"/> Drift and/or debris | <input type="checkbox"/> Other: _____     |
| <input type="checkbox"/> Presence of bed and bank       | <input type="checkbox"/> Other: _____     |
| <input type="checkbox"/> Benches                        | <input type="checkbox"/> Other: _____     |

**Comments:**

Obvious drift line of debris from high flow events. AFP covered with large riprap boulders with fine sediment and grass in between. Weir structure influences AFP upstream.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: T5-RR-LT

**Characteristics of the floodplain unit:**

Average sediment texture: Medium 0-16" rock/cobble

Total veg cover: 90 % Tree: 0 % Shrub: 50 % Herb: 50 %

Community successional stage:

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

**Indicators:**

- |  |   |
|--|---|
| <input type="checkbox"/> Mudcracks                           | <input type="checkbox"/> Soil development |
| <input type="checkbox"/> Ripples                             | <input type="checkbox"/> Surface relief   |
| <input type="checkbox"/> Drift and/or debris                 | <input type="checkbox"/> Other: _____     |
| <input checked="" type="checkbox"/> Presence of bed and bank | <input type="checkbox"/> Other: _____     |
| <input checked="" type="checkbox"/> Benches                  | <input type="checkbox"/> Other: _____     |

**Comments:**

LT in this area extends to the North Canyon wall and Honey Run Road.

## Arid West Ephemeral and Intermittent Streams OHW M Datasheet

<b>Project:</b> Parrot-Phelan Restoration <b>Project Number:</b> 18-019 <b>Stream:</b> Butte Creek <b>Investigator(s):</b> CSW, ADH, JBS, BSA, TDA		<b>Date:</b> 1-7-2020 <b>Town:</b> Chico <b>Photo begin file#:</b> <b>Photo end file#:</b>		<b>Time:</b> 1027 <b>State:</b> CA <b>Photo end file#:</b>			
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?		<b>Location Details:</b> off Honey Run Rd. S.E. of Chico					
Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?		<b>Projection:</b> Transverse Mercator <b>Datum:</b> NAD83 10N <b>Coordinates:</b> 39°42'36.51"N / 121°44'52.40"W (TS)					
<b>Potential anthropogenic influences on the channel system:</b> wier, potential pollution, development dam weir, run-off from Camp Fire burn scar							
<b>Brief site description:</b> right upstream of dam/weir							
<b>Checklist of resources (if available):</b> <table style="width: 100%; border: none;"> <tr> <td style="vertical-align: top; width: 50%;"> <input checked="" type="checkbox"/> Aerial photography            Dates: 1-7-2020  <input checked="" type="checkbox"/> Topographic maps  <input type="checkbox"/> Geologic maps  <input type="checkbox"/> Vegetation maps  <input checked="" type="checkbox"/> Soils maps  <input type="checkbox"/> Rainfall/precipitation maps  <input type="checkbox"/> Existing delineation(s) for site  <input checked="" type="checkbox"/> Global positioning system (GPS)  <input type="checkbox"/> Other studies         </td> <td style="vertical-align: top; width: 50%;"> <input type="checkbox"/> Stream gage data            Gage number:            Period of record:  <input type="checkbox"/> History of recent effective discharges  <input type="checkbox"/> Results of flood frequency analysis  <input type="checkbox"/> Most recent shift-adjusted rating  <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event         </td> </tr> </table>						<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input checked="" type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event
<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input checked="" type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event						
<p style="text-align: center;">Hydrogeomorphic Floodplain Units</p>							
<b>Procedure for identifying and characterizing the floodplain units to assist in identifying the OHW M:</b> <ol style="list-style-type: none"> <li>1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.</li> <li>2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.</li> <li>3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.           <ol style="list-style-type: none"> <li>a) Record the floodplain unit and GPS position.</li> <li>b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.</li> <li>c) Identify any indicators present at the location.</li> </ol> </li> <li>4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.</li> <li>5. Identify the OHW M and record the indicators. Record the OHW M position via:           <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Mapping on aerial photograph  <input checked="" type="checkbox"/> Digitized on computer           </td> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> GPS  <input checked="" type="checkbox"/> Other: surveyed tops (11/1/2018)           </td> </tr> </table> </li> </ol>						<input checked="" type="checkbox"/> Mapping on aerial photograph <input checked="" type="checkbox"/> Digitized on computer	<input checked="" type="checkbox"/> GPS <input checked="" type="checkbox"/> Other: surveyed tops (11/1/2018)
<input checked="" type="checkbox"/> Mapping on aerial photograph <input checked="" type="checkbox"/> Digitized on computer	<input checked="" type="checkbox"/> GPS <input checked="" type="checkbox"/> Other: surveyed tops (11/1/2018)						



Project ID: 18-019 Cross section ID: T5-R2 Date: 1-7-2020 Time: 1027

**Cross section drawing:**



**OHWM**

GPS point: T5-R2-OHWM

**Indicators:**

- ☒ Change in average sediment texture  
☐ Change in vegetation species  
☒ Change in vegetation cover

- ☒ Break in bank slope  
☒ Other: staining  
☐ Other:

**Comments:**

**Floodplain unit:** ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: T5-R2-LFC

**Characteristics of the floodplain unit:**

Average sediment texture: cobble

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

Community successional stage:

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

**Indicators:**

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

**Comments:**

low flow channel under water @ time of survey

Project ID: 18-019 Cross section ID: T5-RL Date: 1/7/2020 Time: 1027

**Floodplain unit:** ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: T5-RL-AFP

**Characteristics of the floodplain unit:**

Average sediment texture: SOIL ~~COBBLE~~ 35

Total veg cover: 80 % Tree: 10 % Shrub: 25 % Herb: 35 %

Community successional stage:

☐ NA

☒ Early (herbaceous & seedlings)

☒ Mid (herbaceous, shrubs, saplings)

☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

☐ Mudcracks

☐ Ripples

☐ Drift and/or debris

☐ Presence of bed and bank

☒ Benches

☒ Soil development

☐ Surface relief

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

**Comments:**

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: T5-RL-LT

**Characteristics of the floodplain unit:**

Average sediment texture: SOIL

Total veg cover: 80 % Tree: 5 % Shrub: 25 % Herb: 50 %

Community successional stage:

☐ NA

☒ Early (herbaceous & seedlings)

☐ Mid (herbaceous, shrubs, saplings)

☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

☐ Mudcracks

☐ Ripples

☐ Drift and/or debris

☐ Presence of bed and bank

☒ Benches

☒ Soil development

☐ Surface relief

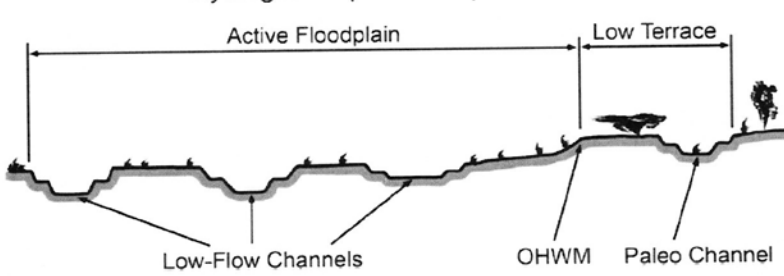
☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

**Comments:**

## Arid West Ephemeral and Intermittent Streams OTHM Datasheet

<b>Project:</b> PARROT-PHELAN RESTORATION <b>Project Number:</b> 18-019 <b>Stream:</b> BOTTE CREEK <b>Investigator(s):</b> CJO, ADH, JBS, BSA, TDA		<b>Date:</b> 1-8-2020 <b>Town:</b> Chico <b>Photo begin file#:</b> <b>Time:</b> 10:00 11:07 <b>State:</b> CA <b>Photo end file#:</b>			
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?  Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?		<b>Location Details:</b> off Honey Run Rd. S.E. of Chico <b>Projection:</b> Transverse Mercator <b>Datum:</b> NAD83 10N <b>Coordinates:</b> 39°42'36.14"N / 121°44'50.37"W (T6)			
<b>Potential anthropogenic influences on the channel system:</b> pollution, gravel removal, development in area run-off from Camp Fire burn scar					
<b>Brief site description:</b> down stream side of upper rock bar. shallow riffles across entire channel willows bunch grass, etc. thick on rock					
<b>Checklist of resources (if available):</b> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Aerial photography            Dates: 1-7-2020  <input checked="" type="checkbox"/> Topographic maps  <input type="checkbox"/> Geologic maps  <input type="checkbox"/> Vegetation maps  <input checked="" type="checkbox"/> Soils maps  <input type="checkbox"/> Rainfall/precipitation maps  <input type="checkbox"/> Existing delineation(s) for site  <input checked="" type="checkbox"/> Global positioning system (GPS)  <input type="checkbox"/> Other studies         </td> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Stream gage data            Gage number:            Period of record:  <input type="checkbox"/> History of recent effective discharges  <input type="checkbox"/> Results of flood frequency analysis  <input type="checkbox"/> Most recent shift-adjusted rating  <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event         </td> </tr> </table>				<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input checked="" type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event
<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input checked="" type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event				
<b>Hydrogeomorphic Floodplain Units</b> 					
<b>Procedure for identifying and characterizing the floodplain units to assist in identifying the OTHM:</b> <ol style="list-style-type: none"> <li>1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.</li> <li>2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.</li> <li>3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.           <ol style="list-style-type: none"> <li>a) Record the floodplain unit and GPS position.</li> <li>b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.</li> <li>c) Identify any indicators present at the location.</li> </ol> </li> <li>4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.</li> <li>5. Identify the OTHM and record the indicators. Record the OTHM position via:           <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Mapping on aerial photograph  <input checked="" type="checkbox"/> Digitized on computer           </td> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> GPS  <input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)           </td> </tr> </table> </li> </ol>				<input checked="" type="checkbox"/> Mapping on aerial photograph <input checked="" type="checkbox"/> Digitized on computer	<input checked="" type="checkbox"/> GPS <input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)
<input checked="" type="checkbox"/> Mapping on aerial photograph <input checked="" type="checkbox"/> Digitized on computer	<input checked="" type="checkbox"/> GPS <input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)				

Project ID: \8-019 Cross section ID: T6-RR Date: 1-7-2020 Time: 1107 1038

**Cross section drawing:**



**OHWM**

GPS point: T6-RR-OHWM

**Indicators:**

- ☒ Change in average sediment texture  
☐ Change in vegetation species  
☐ Change in vegetation cover

- ☐ Break in bank slope  
☒ Other: visible H<sub>2</sub>O line  
☐ Other: \_\_\_\_\_

**Comments:**

about @ current water line

**Floodplain unit:**

☒ Low-Flow Channel

☐ Active Floodplain

☐ Low Terrace

GPS point: T6-RR-LFC

**Characteristics of the floodplain unit:**

Average sediment texture: \_\_\_\_\_

Total veg cover: \_\_\_\_\_% Tree: \_\_\_\_\_% Shrub: \_\_\_\_\_% Herb: \_\_\_\_\_%

Community successional stage:

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

**Indicators:**

- ☐ Mudcracks  
☐ Ripples  
☐ Drift and/or debris  
☐ Presence of bed and bank  
☐ Benches

- ☐ Soil development  
☐ Surface relief  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

**Comments:**

low flow channel under water @ time of survey

Project ID: 18-019 Cross section ID: T6-RR Date: 1-8-2020 Time: 1107

**Floodplain unit:** ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: T6-RR-AFP

**Characteristics of the floodplain unit:**

Average sediment texture: sandy

Total veg cover: 30 % Tree:      % Shrub:      % Herb: 30 %

Community successional stage:

☐ NA

☒ Early (herbaceous & seedlings)

☐ Mid (herbaceous, shrubs, saplings)

☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

☐ Mudcracks

☐ Ripples

☐ Drift and/or debris

☐ Presence of bed and bank

☒ Benches

☒ Soil development

☐ Surface relief

☐ Other:                     

☐ Other:                     

☐ Other:                     

**Comments:**

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: T6-RR-LT

**Characteristics of the floodplain unit:**

Average sediment texture: sandy w/ minimal cobble

Total veg cover: 85 % Tree: 0 % Shrub:      % Herb: 85 %

Community successional stage:

☐ NA

☒ Early (herbaceous & seedlings)

☐ Mid (herbaceous, shrubs, saplings)

☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

☐ Mudcracks

☐ Ripples

☐ Drift and/or debris

☐ Presence of bed and bank

☒ Benches

☒ Soil development

☐ Surface relief

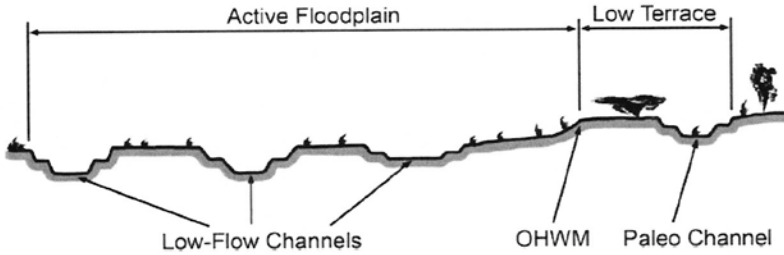
☐ Other:                     

☐ Other:                     

☐ Other:                     

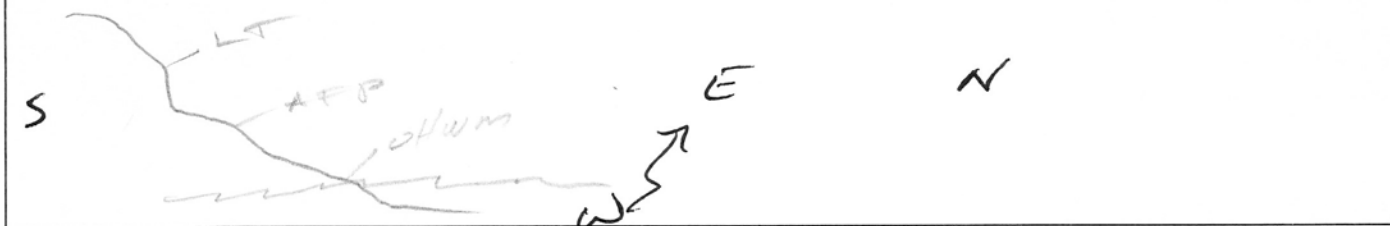
**Comments:**

## Arid West Ephemeral and Intermittent Streams OWHM Datasheet

<b>Project:</b> Parrot-Phelan Restoration <b>Project Number:</b> 18-019 <b>Stream:</b> Butte Creek <b>Investigator(s):</b> CSW, ADH, JBS, BSA, TDA		<b>Date:</b> 1-8-2020 <b>Town:</b> Chico <b>Photo begin file#:</b> <b>Time:</b> 1030 <b>State:</b> CA <b>Photo end file#:</b>	
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?  Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?		<b>Location Details:</b> off Honey Run Rd. S.E. of Chico <b>Projection:</b> Transverse Mercator <b>Datum:</b> NAD83 <b>Coordinates:</b> 39°42'36.14"N / 121°44'50.37"W (T6)	
<b>Potential anthropogenic influences on the channel system:</b> immediate down stream of berm & ponded area			
<b>Brief site description:</b> shallow riffles across channel. mostly trees & herbaceous veg			
<b>Checklist of resources (if available):</b> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <input checked="" type="checkbox"/> Aerial photography            Dates: 1-7-2020  <input checked="" type="checkbox"/> Topographic maps  <input type="checkbox"/> Geologic maps  <input type="checkbox"/> Vegetation maps  <input checked="" type="checkbox"/> Soils maps  <input type="checkbox"/> Rainfall/precipitation maps  <input type="checkbox"/> Existing delineation(s) for site  <input checked="" type="checkbox"/> Global positioning system (GPS)  <input type="checkbox"/> Other studies         </div> <div style="width: 45%;"> <input type="checkbox"/> Stream gage data            Gage number:            Period of record:  <input type="checkbox"/> History of recent effective discharges  <input type="checkbox"/> Results of flood frequency analysis  <input type="checkbox"/> Most recent shift-adjusted rating  <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event         </div> </div>			
<b>Hydrogeomorphic Floodplain Units</b> 			
<b>Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:</b> <ol style="list-style-type: none"> <li>1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.</li> <li>2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.</li> <li>3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.           <ol style="list-style-type: none"> <li>a) Record the floodplain unit and GPS position.</li> <li>b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.</li> <li>c) Identify any indicators present at the location.</li> </ol> </li> <li>4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.</li> <li>5. Identify the OHWM and record the indicators. Record the OHWM position via:           <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div> <input checked="" type="checkbox"/> Mapping on aerial photograph  <input checked="" type="checkbox"/> Digitized on computer           </div> <div> <input checked="" type="checkbox"/> GPS  <input checked="" type="checkbox"/> Other: <i>surveyal logs (11/1/2018)</i> </div> </div> </li> </ol>			

Project ID: 18-019 Cross section ID: T6-RL Date: 1/8/2020 Time: 1030

**Cross section drawing:**



**OHWM**

GPS point: T6-RL-OHWM

**Indicators:**

- ☐ Change in average sediment texture  
☐ Change in vegetation species  
☒ Change in vegetation cover

- ☒ Break in bank slope  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

Comments:

**Floodplain unit:** ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: T6-RL-LFC

**Characteristics of the floodplain unit:**

Average sediment texture: \_\_\_\_\_

Total veg cover: \_\_\_\_\_% Tree: \_\_\_\_\_% Shrub: \_\_\_\_\_% Herb: \_\_\_\_\_%

Community successional stage:

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

**Indicators:**

- ☐ Mudcracks  
☐ Ripples  
☐ Drift and/or debris  
☐ Presence of bed and bank  
☐ Benches

- ☐ Soil development  
☐ Surface relief  
☒ Other: water  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

Comments:

LFC under water @ time of survey



Project ID: 18-019 Cross section ID: T6-RL Date: 1-8-2020 Time: 1030

**Floodplain unit:** ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: T6-RL-AFP

**Characteristics of the floodplain unit:**

Average sediment texture: Boulder/cobble+silt/sand

Total veg cover: 85 % Tree: 0 % Shrub: 70 % Herb: 80 %

Community successional stage:

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

**Indicators:**

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

Comments:

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: T6-RL-LT

**Characteristics of the floodplain unit:**

Average sediment texture: boulder/cobble

Total veg cover: 75 % Tree: 0.5 % Shrub: 10 % Herb: 100 %

Community successional stage:

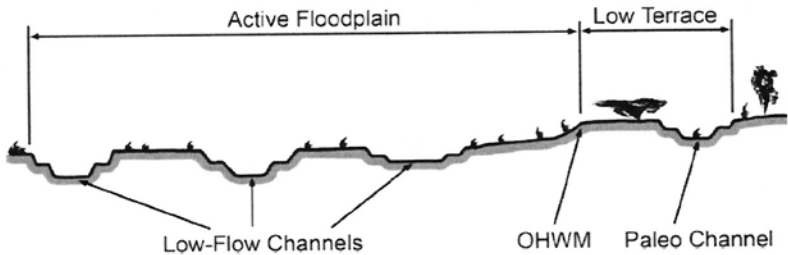
- ☐ NA ☒ Mid (herbaceous, shrubs, saplings)  
☒ Early (herbaceous & seedlings) ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

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

Comments:

## Arid West Ephemeral and Intermittent Streams OHW M Datasheet

<b>Project:</b> Parrot - Phelan Restoration <b>Project Number:</b> 18-019 <b>Stream:</b> Butte Creek <b>Investigator(s):</b> CJO, ADH, JS, BSA, TDA		<b>Date:</b> 1-8-2020 <b>Town:</b> Chico <b>Photo begin file#:</b> <b>Time:</b> 1058 <b>State:</b> CA <b>Photo end file#:</b>			
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?  Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?		<b>Location Details:</b> off Honey Run Rd. S.E. of Chico <b>Projection:</b> Transverse Mercator <b>Datum:</b> NAD83 <b>ION</b> <b>Coordinates:</b> 39°42'36.30"N / 121°44'50.45"W (IT)			
<b>Potential anthropogenic influences on the channel system:</b> center pt's in upper rock bar. berm in channel (man-made) w/ pond structure. star thistle & herbaceous veg					
<b>Brief site description:</b> dry center of upper rock bar					
<b>Checklist of resources (if available):</b> <table style="width: 100%; border: none;"> <tr> <td style="vertical-align: top; width: 50%;"> <input checked="" type="checkbox"/> Aerial photography            Dates: 1-7-2020  <input checked="" type="checkbox"/> Topographic maps  <input type="checkbox"/> Geologic maps  <input type="checkbox"/> Vegetation maps  <input checked="" type="checkbox"/> Soils maps  <input type="checkbox"/> Rainfall/precipitation maps  <input type="checkbox"/> Existing delineation(s) for site  <input checked="" type="checkbox"/> Global positioning system (GPS)  <input type="checkbox"/> Other studies         </td> <td style="vertical-align: top; width: 50%;"> <input type="checkbox"/> Stream gage data            Gage number:            Period of record:  <input type="checkbox"/> History of recent effective discharges  <input type="checkbox"/> Results of flood frequency analysis  <input type="checkbox"/> Most recent shift-adjusted rating  <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event         </td> </tr> </table>				<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input checked="" type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event
<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input checked="" type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event				
<b>Hydrogeomorphic Floodplain Units</b> 					
<b>Procedure for identifying and characterizing the floodplain units to assist in identifying the OHW M:</b> <ol style="list-style-type: none"> <li>1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.</li> <li>2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.</li> <li>3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.           <ol style="list-style-type: none"> <li>a) Record the floodplain unit and GPS position.</li> <li>b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.</li> <li>c) Identify any indicators present at the location.</li> </ol> </li> <li>4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.</li> <li>5. Identify the OHW M and record the indicators. Record the OHW M position via:           <table style="width: 100%; border: none; margin-top: 5px;"> <tr> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Mapping on aerial photograph  <input checked="" type="checkbox"/> Digitized on computer           </td> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> GPS  <input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)           </td> </tr> </table> </li> </ol>				<input checked="" type="checkbox"/> Mapping on aerial photograph <input checked="" type="checkbox"/> Digitized on computer	<input checked="" type="checkbox"/> GPS <input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)
<input checked="" type="checkbox"/> Mapping on aerial photograph <input checked="" type="checkbox"/> Digitized on computer	<input checked="" type="checkbox"/> GPS <input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)				

Project ID: 18-019 Cross section ID: T7-RR Date: 1-8-2020 Time: 1058

**Cross section drawing:**



**OHWM**

GPS point: T7-RR-OHWM

**Indicators:**

- ☒ Change in average sediment texture
- ☐ Change in vegetation species
- ☐ Change in vegetation cover

- ☒ Break in bank slope
- ☐ Other: \_\_\_\_\_
- ☐ Other: \_\_\_\_\_

**Comments:**

from silt to small cobble

**Floodplain unit:** ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: T7-RR-LFC

**Characteristics of the floodplain unit:**

Average sediment texture: cobble

Total veg cover: \_\_\_\_\_% Tree: \_\_\_\_\_% Shrub: \_\_\_\_\_% Herb: \_\_\_\_\_%

Community successional stage:

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

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches

- ☐ Soil development
- ☐ Surface relief
- ☐ Other: \_\_\_\_\_
- ☐ Other: \_\_\_\_\_
- ☐ Other: \_\_\_\_\_

**Comments:**

low flow channel under water at time of survey.

Project ID: 18019 Cross section ID: T7-RR Date: 1-8-2020 Time: 1058

**Floodplain unit:** ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: T7-RR-AFP

**Characteristics of the floodplain unit:**

Average sediment texture: cobble & pebble w/ sand

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

Community successional stage:

- |  |  |
|--|--|
| <input type="checkbox"/> NA  | <input type="checkbox"/> Mid (herbaceous, shrubs, saplings)      |
| <input checked="" type="checkbox"/> Early (herbaceous & seedlings) | <input type="checkbox"/> Late (herbaceous, shrubs, mature trees) |

**Indicators:**

- |   |   |
|---|---|
| <input type="checkbox"/> Mudcracks                | <input type="checkbox"/> Soil development                   |
| <input type="checkbox"/> Ripples                  | <input type="checkbox"/> Surface relief                     |
| <input type="checkbox"/> Drift and/or debris      | <input type="checkbox"/> Other: <u>                    </u> |
| <input type="checkbox"/> Presence of bed and bank | <input type="checkbox"/> Other: <u>                    </u> |
| <input checked="" type="checkbox"/> Benches       | <input type="checkbox"/> Other: <u>                    </u> |

**Comments:**

on manmade face of rock bar

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: T7-RR-LT

**Characteristics of the floodplain unit:**

Average sediment texture: cobble & pebble w/ sand

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

Community successional stage:

- |  |  |
|--|--|
| <input type="checkbox"/> NA  | <input type="checkbox"/> Mid (herbaceous, shrubs, saplings)      |
| <input checked="" type="checkbox"/> Early (herbaceous & seedlings) | <input type="checkbox"/> Late (herbaceous, shrubs, mature trees) |

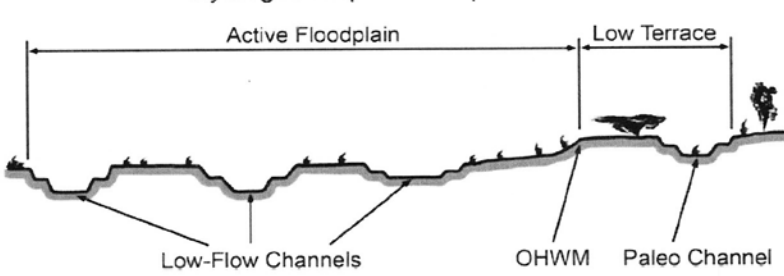
**Indicators:**

- |   |   |
|---|---|
| <input type="checkbox"/> Mudcracks                | <input type="checkbox"/> Soil development                   |
| <input type="checkbox"/> Ripples                  | <input type="checkbox"/> Surface relief                     |
| <input type="checkbox"/> Drift and/or debris      | <input type="checkbox"/> Other: <u>                    </u> |
| <input type="checkbox"/> Presence of bed and bank | <input type="checkbox"/> Other: <u>                    </u> |
| <input checked="" type="checkbox"/> Benches       | <input type="checkbox"/> Other: <u>                    </u> |

**Comments:**

top of man made bar

## Arid West Ephemeral and Intermittent Streams OWHM Datasheet

<b>Project:</b> Parrot-Phelan Restoration <b>Project Number:</b> 18-019 <b>Stream:</b> Bo He Creek <b>Investigator(s):</b> CSW, ADH, JBS, BSA, TDA		<b>Date:</b> 1-8-2020 <b>Town:</b> Chico <b>Photo begin file#:</b> <b>Time:</b> 10:58 <b>State:</b> CA <b>Photo end file#:</b>			
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?  Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?		<b>Location Details:</b> off Honey Run Rd. S.E. of Chico <b>Projection:</b> Transverse Mercator <b>Datum:</b> NAD83 <b>WGS</b> <b>Coordinates:</b> 39°42'36.30"N / 121°44'50.45"W (+7)			
<b>Potential anthropogenic influences on the channel system:</b> berm (man-made in center of channel) across stream from rock bar, channel deeper than 1/2 stream					
<b>Brief site description:</b> wooded w/ younger trees & herbaceous vegetation					
<b>Checklist of resources (if available):</b> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Aerial photography            Dates: 1-7-2020  <input checked="" type="checkbox"/> Topographic maps  <input type="checkbox"/> Geologic maps  <input type="checkbox"/> Vegetation maps  <input checked="" type="checkbox"/> Soils maps  <input type="checkbox"/> Rainfall/precipitation maps  <input type="checkbox"/> Existing delineation(s) for site  <input checked="" type="checkbox"/> Global positioning system (GPS)  <input type="checkbox"/> Other studies         </td> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Stream gage data            Gage number:            Period of record:  <input type="checkbox"/> History of recent effective discharges  <input type="checkbox"/> Results of flood frequency analysis  <input type="checkbox"/> Most recent shift-adjusted rating  <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event         </td> </tr> </table>				<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input checked="" type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event
<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020 <input checked="" type="checkbox"/> Topographic maps <input type="checkbox"/> Geologic maps <input type="checkbox"/> Vegetation maps <input checked="" type="checkbox"/> Soils maps <input type="checkbox"/> Rainfall/precipitation maps <input type="checkbox"/> Existing delineation(s) for site <input checked="" type="checkbox"/> Global positioning system (GPS) <input type="checkbox"/> Other studies	<input type="checkbox"/> Stream gage data Gage number: Period of record: <input type="checkbox"/> History of recent effective discharges <input type="checkbox"/> Results of flood frequency analysis <input type="checkbox"/> Most recent shift-adjusted rating <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event				
<b>Hydrogeomorphic Floodplain Units</b> 					
<b>Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:</b> <ol style="list-style-type: none"> <li>1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.</li> <li>2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.</li> <li>3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.           <ol style="list-style-type: none"> <li>a) Record the floodplain unit and GPS position.</li> <li>b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.</li> <li>c) Identify any indicators present at the location.</li> </ol> </li> <li>4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.</li> <li>5. Identify the OHWM and record the indicators. Record the OHWM position via:           <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;"> <input checked="" type="checkbox"/> Mapping on aerial photograph  <input checked="" type="checkbox"/> Digitized on computer           </td> <td style="width: 50%;"> <input checked="" type="checkbox"/> GPS  <input checked="" type="checkbox"/> Other: surveyed topo (11-1-2018)           </td> </tr> </table> </li> </ol>				<input checked="" type="checkbox"/> Mapping on aerial photograph <input checked="" type="checkbox"/> Digitized on computer	<input checked="" type="checkbox"/> GPS <input checked="" type="checkbox"/> Other: surveyed topo (11-1-2018)
<input checked="" type="checkbox"/> Mapping on aerial photograph <input checked="" type="checkbox"/> Digitized on computer	<input checked="" type="checkbox"/> GPS <input checked="" type="checkbox"/> Other: surveyed topo (11-1-2018)				

Project ID: 18-019 Cross section ID: T7-RL Date: 1-8-2020 Time: 1058

**Cross section drawing:**



**OHWM**

GPS point: T7-RL-OHWM

**Indicators:**

- ☐ Change in average sediment texture  
☐ Change in vegetation species  
☒ Change in vegetation cover

- ☒ Break in bank slope  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

Comments:

**Floodplain unit:** ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: T7-RL-LFC

**Characteristics of the floodplain unit:**

Average sediment texture: cobble

Total veg cover: \_\_\_\_\_% Tree: \_\_\_\_\_% Shrub: \_\_\_\_\_% Herb: \_\_\_\_\_%

Community successional stage:

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

**Indicators:**

- ☐ Mudcracks  
☐ Ripples  
☐ Drift and/or debris  
☐ Presence of bed and bank  
☐ Benches

- ☐ Soil development  
☐ Surface relief  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

Comments:

low flow channel under water @ time  
of survey

Project ID: 18-019 Cross section ID: T7-RL Date: 1-8-2020 Time: 1058

**Floodplain unit:** ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: T7-RL-AFP

**Characteristics of the floodplain unit:**

Average sediment texture: cobble, boulders/sandy silt

Total veg cover: 95 % Tree: 20 % Shrub: 5 % Herb: 75 %

Community successional stage:

☐ NA

☒ Early (herbaceous & seedlings)

☒ Mid (herbaceous, shrubs, saplings)

☒ Late (herbaceous, shrubs, mature trees)

**Indicators:**

☐ Mudcracks

☐ Ripples

☐ Drift and/or debris

☐ Presence of bed and bank

☒ Benches

☐ Soil development

☐ Surface relief

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

**Comments:**

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: T7-RL-LT

**Characteristics of the floodplain unit:**

Average sediment texture: Boulder silt/sand

Total veg cover: 95 % Tree: 0 % Shrub: 5 % Herb: 95 %

Community successional stage:

☐ NA

☒ Early (herbaceous & seedlings)

☒ Mid (herbaceous, shrubs, saplings)

☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

☐ Mudcracks

☐ Ripples

☐ Drift and/or debris

☐ Presence of bed and bank

☒ Benches

☐ Soil development

☐ Surface relief

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

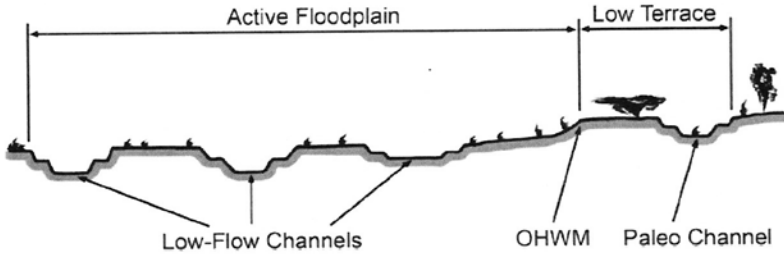
☐ Other: \_\_\_\_\_

**Comments:**



T8 - RR

# Arid West Ephemeral and Intermittent Streams OHW M Datasheet

<b>Project:</b> Parrot - Phelan Restoration <b>Project Number:</b> 18-019 <b>Stream:</b> Bulle Creek <b>Investigator(s):</b> CJS, ADH, J S, BSA, TDA		<b>Date:</b> 1-8-2020 <b>Time:</b> 1130 <b>Town:</b> Chico <b>State:</b> CA <b>Photo begin file#:</b> <b>Photo end file#:</b>	
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?  Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?		<b>Location Details:</b> off Honey Run Rd S.E. of Chico <b>Projection:</b> Transverse Mercator <b>Datum:</b> NAD83 <b>10m</b> <b>Coordinates:</b> 39°42'35.95"N / 121°44'48.28"W (T8)	
<b>Potential anthropogenic influences on the channel system:</b> pollution, development in area, gravel removal run-off from Camp Fire burn scar			
<b>Brief site description:</b> immediate up-stream of upper rock bar just upstream of bend in channel			
<b>Checklist of resources (if available):</b> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <input checked="" type="checkbox"/> Aerial photography            Dates: 1-7-2020  <input checked="" type="checkbox"/> Topographic maps  <input type="checkbox"/> Geologic maps  <input type="checkbox"/> Vegetation maps  <input checked="" type="checkbox"/> Soils maps  <input type="checkbox"/> Rainfall/precipitation maps  <input type="checkbox"/> Existing delineation(s) for site  <input checked="" type="checkbox"/> Global positioning system (GPS)  <input type="checkbox"/> Other studies         </div> <div style="width: 45%;"> <input type="checkbox"/> Stream gage data            Gage number:            Period of record:  <input type="checkbox"/> History of recent effective discharges  <input type="checkbox"/> Results of flood frequency analysis  <input type="checkbox"/> Most recent shift-adjusted rating  <input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event         </div> </div>			
<b>Hydrogeomorphic Floodplain Units</b> 			
<b>Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:</b>			
<ol style="list-style-type: none"> <li>1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.</li> <li>2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.</li> <li>3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.               <ol style="list-style-type: none"> <li>a) Record the floodplain unit and GPS position.</li> <li>b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.</li> <li>c) Identify any indicators present at the location.</li> </ol> </li> <li>4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.</li> <li>5. Identify the OHWM and record the indicators. Record the OHWM position via:               <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div> <input checked="" type="checkbox"/> Mapping on aerial photograph  <input checked="" type="checkbox"/> Digitized on computer                 </div> <div> <input checked="" type="checkbox"/> GPS  <input checked="" type="checkbox"/> Other: surveyed topo (11/1/2018)                 </div> </div> </li> </ol>			

Project ID: 18-019 Cross section ID: T8-RR Date: 1-8-2020 Time: 1130

**Cross section drawing:**



**OHWM**

GPS point: T8-RR-OHWM

**Indicators:**

- |  |   |
|--|---|
| <input type="checkbox"/> Change in average sediment texture    | <input checked="" type="checkbox"/> Break in bank slope |
| <input type="checkbox"/> Change in vegetation species          | <input type="checkbox"/> Other: _____                   |
| <input checked="" type="checkbox"/> Change in vegetation cover | <input type="checkbox"/> Other: _____                   |

**Comments:**

creaker bed OHWM break in Bank slope and "bathtub ring" as indicators

**Floodplain unit:** ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: T8-RR-LFC

**Characteristics of the floodplain unit:**

Average sediment texture: cobble  
Total veg cover: 0 % Tree: \_\_\_\_\_ % Shrub: \_\_\_\_\_ % Herb: \_\_\_\_\_ %  
Community successional stage:

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> NA                  | <input type="checkbox"/> Mid (herbaceous, shrubs, saplings)      |
| <input type="checkbox"/> Early (herbaceous & seedlings) | <input type="checkbox"/> Late (herbaceous, shrubs, mature trees) |

**Indicators:**

- |   |   |
|---|---|
| <input type="checkbox"/> Mudcracks                | <input type="checkbox"/> Soil development |
| <input type="checkbox"/> Ripples                  | <input type="checkbox"/> Surface relief   |
| <input type="checkbox"/> Drift and/or debris      | <input type="checkbox"/> Other: _____     |
| <input type="checkbox"/> Presence of bed and bank | <input type="checkbox"/> Other: _____     |
| <input type="checkbox"/> Benches                  | <input type="checkbox"/> Other: _____     |

**Comments:**

low flow channel under water @ time of survey

Project ID: 18-019 Cross section ID: 78-RR Date: 1-8-2020 Time: 1130

**Floodplain unit:** ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: 78-RR-AFP

**Characteristics of the floodplain unit:**

Average sediment texture: cobble, bolder, w/ silt and sand

Total veg cover: 35 % Tree: 0 % Shrub: 0 % Herb: 100 %

Community successional stage:

☐ NA

☒ Early (herbaceous & seedlings)

☐ Mid (herbaceous, shrubs, saplings)

☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

☐ Mudcracks

☐ Ripples

☒ Drift and/or debris

☐ Presence of bed and bank

☒ Benches

☐ Soil development

☐ Surface relief

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

**Comments:**

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: 78-RR-LT

**Characteristics of the floodplain unit:**

Average sediment texture: cobble, bolder, w/ silt and sand

Total veg cover: 65 % Tree: 0 % Shrub: 0 % Herb: 100 %

Community successional stage:

☐ NA

☒ Early (herbaceous & seedlings)

☐ Mid (herbaceous, shrubs, saplings)

☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

☐ Mudcracks

☐ Ripples

☐ Drift and/or debris

☐ Presence of bed and bank

☒ Benches

☒ Soil development

☐ Surface relief

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

**Comments:**

# Arid West Ephemeral and Intermittent Streams OHW M Datasheet

<b>Project:</b> Parrot-Phelan Restoration <b>Project Number:</b> 18-019 <b>Stream:</b> Butte Creek <b>Investigator(s):</b> CSW, ADH, JBS, SSA, TDA		<b>Date:</b> 1-8-2020 <b>Town:</b> Chico <b>Photo begin file#:</b>		<b>Time:</b> 11:30 <b>State:</b> CA <b>Photo end file#:</b>	
Y <input checked="" type="checkbox"/> / N <input type="checkbox"/> Do normal circumstances exist on the site?		<b>Location Details:</b> off Honey Run Rd. S.E. of Chico			
Y <input type="checkbox"/> / N <input checked="" type="checkbox"/> Is the site significantly disturbed?		<b>Projection:</b> Transverse Mercator <b>Datum:</b> NAD83 <b>10N</b> <b>Coordinates:</b> 39°42'35.95"N / 121°44'48.28"W (T8)			
<b>Potential anthropogenic influences on the channel system:</b> immediate up stream of man made berm & ponding area					
<b>Brief site description:</b> ripples in channel, ~2' deep. native trees, shrubs & herbaceous vegetation.					
<b>Checklist of resources (if available):</b>					
<input checked="" type="checkbox"/> Aerial photography Dates: 1-7-2020		<input type="checkbox"/> Stream gage data Gage number:			
<input checked="" type="checkbox"/> Topographic maps		Period of record:			
<input type="checkbox"/> Geologic maps		<input type="checkbox"/> History of recent effective discharges			
<input type="checkbox"/> Vegetation maps		<input type="checkbox"/> Results of flood frequency analysis			
<input checked="" type="checkbox"/> Soils maps		<input type="checkbox"/> Most recent shift-adjusted rating			
<input type="checkbox"/> Rainfall/precipitation maps		<input type="checkbox"/> Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event			
<input type="checkbox"/> Existing delineation(s) for site					
<input checked="" type="checkbox"/> Global positioning system (GPS)					
<input type="checkbox"/> Other studies					
<b>Hydrogeomorphic Floodplain Units</b>					
<b>Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:</b>					
1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.					
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.					
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.					
a) Record the floodplain unit and GPS position.					
b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.					
c) Identify any indicators present at the location.					
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.					
5. Identify the OHWM and record the indicators. Record the OHWM position via:					
<input type="checkbox"/> Mapping on aerial photograph		<input checked="" type="checkbox"/> GPS			
<input type="checkbox"/> Digitized on computer		<input checked="" type="checkbox"/> Other: surveyor topo (1/1/2020)			

Project ID: 18019 Cross section ID: T8-RL Date: 1-8-2020 Time: 1130

**Cross section drawing:**



**OHWM**

GPS point: T8-RL-OHWM

**Indicators:**

- ☐ Change in average sediment texture  
☐ Change in vegetation species  
☒ Change in vegetation cover

- ☒ Break in bank slope  
☐ Other: \_\_\_\_\_  
☐ Other: \_\_\_\_\_

**Comments:**

**Floodplain unit:** ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: T8-RL-LFC

**Characteristics of the floodplain unit:**

Average sediment texture: cobble

Total veg cover: 0 % Tree: \_\_\_\_\_ % Shrub: \_\_\_\_\_ % Herb: \_\_\_\_\_ %

Community successional stage:

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

**Indicators:**

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

**Comments:**

low flow channel under water @ time of survey

Project ID: 13-019 Cross section ID: T8-RL Date: 1-8-2020 Time: 1130

**Floodplain unit:** ☐ Low-Flow Channel ☒ Active Floodplain ☐ Low Terrace

GPS point: T8-RL-AFP

**Characteristics of the floodplain unit:**

Average sediment texture: silt/sand

Total veg cover: 90 % Tree: 5 % Shrub: 5 % Herb: 90 %

Community successional stage:

☐ NA

☒ Early (herbaceous & seedlings)

☒ Mid (herbaceous, shrubs, saplings)

☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

☐ Mudcracks

☐ Ripples

☐ Drift and/or debris

☐ Presence of bed and bank

☒ Benches

☐ Soil development

☐ Surface relief

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

**Comments:**

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☒ Low Terrace

GPS point: T8-RL-LT

**Characteristics of the floodplain unit:**

Average sediment texture: \_\_\_\_\_

Total veg cover: 90 % Tree: 5 % Shrub: 50 % Herb: 90 %

Community successional stage:

☐ NA

☒ Early (herbaceous & seedlings)

☒ Mid (herbaceous, shrubs, saplings)

☒ Late (herbaceous, shrubs, mature trees)

**Indicators:**

☐ Mudcracks

☐ Ripples

☐ Drift and/or debris

☐ Presence of bed and bank

☒ Benches

☐ Soil development

☐ Surface relief

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

☐ Other: \_\_\_\_\_

**Comments:**

### Wentworth Size Classes

Inches (in)	Millimeters (mm)	Wentworth size class	
10.08	256	Boulder	Gravel
2.56	64	Cobble	
0.157	4	Pebble	
0.079	2.00	Granule	
0.039	1.00	Very coarse sand	Sand
0.020	0.50	Coarse sand	
1/2 0.0098	0.25	Medium sand	
1/4 0.005	0.125	Fine sand	
1/8 0.0025	0.0625	Very fine sand	
1/16 0.0012	0.031	Coarse silt	Silt
1/32 0.00061	0.0156	Medium silt	
1/64 0.00031	0.0078	Fine silt	
1/128 0.00015	0.0039	Very fine silt	
		Clay	Mud

