

BIOLOGICAL TECHNICAL REPORT

PG&E PIPELINE MAINTENANCE PROJECTS Eureka, California

R-354 FRESHWATER SLOUGH 8" PIPELINE DECOMMISSIONING

R-519 RYAN SLOUGH 4" PIPELINE CROSSING REPLACEMENT

RT-102 RYAN CREEK 12" PIPELINE EXPOSURE REMEDIATION

Project No. 1702-2341

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1.0 INTRODUCTION

The purpose of this report is to detail the findings of the biological technical study conducted for the proposed Pacific Gas & Electric (PG&E) Pipeline Maintenance Projects, R-354 at Freshwater Slough Pipeline Decommissioning, R-519 Ryan Slough Pipeline Crossing Replacement, and RT-102 at Ryan Creek Pipeline Exposure Remediation in Eureka, California. This technical report includes a review of pertinent literature, a review of regulatory requirements, results of reconnaissance field surveys, and a preliminary analysis of general impacts of project implementation on biological resources.

Following this introduction, there is a description of the proposed PG&E Pipeline Maintenance Projects (Project), followed by the methodology section, which describes field studies and analytical methods used to assess the project sites. The methodology section includes a review of the regulatory requirements; a review of literature concerning special-status species, sensitive habitats, and general biological conditions; and, a description of field reconnaissance methods. The environmental setting describes abiotic and biotic conditions at the project site including climate, soils, typical habitats and associated plant and wildlife species, and special-status species reported in or near the project area. The final section summarizes the anticipated impacts of project implementation along with suggested mitigation measures to reduce project impacts to less than significant levels.

2.0 PROJECT DESCRIPTION

PG&E is planning pipeline maintenance Projects at three locations in Eureka, California. These include the decommissioning and removal of the R-354 (Line 137B) crossing at Freshwater Slough, the replacement of R-519 (Line 137C) crossing at Ryan Slough, and the remediation of pipeline exposures caused by erosion at RT-102 (Line 177A) near Ryan Creek.

2.1 R-354 (LINE 137B) MAINTENANCE PROJECT

PG&E is planning the decommissioning and removal of portions of the previously retired L-137B natural gas pipeline crossing at Freshwater Slough located in Eureka, Humboldt County, California. The biological study area at this site is 7.20 acres consisting primarily of farm and pasture lands used for livestock grazing. Freshwater Slough, a tidal slough, bisects the study area, and the pipeline planned for decommissioning crosses the slough. The L-137B crossing consists of a retired 8-inch nominal steel pipeline that is buried through the south bank and across the slough but rises out of the slough at the north bank and is exposed near the waterline on the north bank where it terminates. This pipeline segment will be pigged and flushed, filled with cement, and the exposed end at the north bank removed to a depth of approximately 5-feet below existing slough bed elevations. A remnant of this pipeline, presently disconnected from the crossing, passes through a levee that forms the north bank. This pipeline segment will be removed through the levee and across the field behind the levee for approximately 50 feet. A concrete slab that is a remnant of a concrete cutoff wall (anti-seepage wall) that was located in the levee and associated with the pipeline crossing will also be removed as part of the decommissioning project. Additionally, shoreline stabilization mats are proposed for placement along the north levee to slow the erosion of the north bank, and a sink hole located behind the north abutment of a private bridge at the site (Christie Bridge) will be filled with cement slurry to slow erosion at the bridge abutment.

2.2 R-519 (LINE 137C) MAINTENANCE PROJECT

PG&E is planning the replacement of the L137C gas pipeline crossing at Ryan Slough located just north of Myrtle Avenue near Eureka, Humboldt County, California. The biological study area at this site is 37.9 acres consisting primarily of farm and pasture lands used for livestock grazing. Ryan Slough, a tidal slough, is located within the northwestern edge of the study area, and the pipeline planned for replacement crosses Ryan Slough just north of Myrtle Avenue. The L-137C crossing consists of a 4-inch nominal steel pipeline that crosses the slough and is exposed at the surface in the slough crossing. Replacement of this pipeline crossing using jack and bore methodology is proposed to minimize disturbance in the slough. Bore holes used for installation will be sited in upland and disturbed portions of the site. Once the pipeline replacement is installed and tie-ins are complete, the exposed portion of the pipeline will be removed from Ryan Slough.

2.3 RT-102 (LINE 177A) MAINTENANCE PROJECT

PG&E is planning the remediation of erosional issues resulting from water flow across an earth berm parallel to the west bank of Ryan Creek in which the pipeline is buried. Erosion has created three sinkholes that have exposed a segment of the natural gas pipeline L-177A approximately 0.5-mile south of Myrtle Avenue near Ryan Creek, within property that was

previously owned by the Green Diamond Resource Company but was purchased by Humboldt County in 2014 and is now known as the McKay Community Forest. The L-177A pipeline alignment follows a retired railroad berm that was built on top of a redwood timber roadway. The biological study area at this site is 2.64 acres and consists of both the sinkhole repair location and the proposed access route along a PG&E easement between the sinkhole location and Myrtle Avenue. This area was historically used for timber harvest and is now planned for multiple uses including public access and recreation (hiking trails), timber harvest, and watershed and resource conservation (Humboldt County, 2017). Ryan Creek, a perennial drainage, occurs approximately 50 feet from the sinkhole location. Proposed work associated with the remediation will involve terrestrial excavation and reconstruction of the railroad berm at the sink hole locations, removal of the underlying redwood timber roadway causing the subsurface water flow and undercutting, pipeline corrosion repair, backfill of the excavated area with engineered fill, installation of a culvert to convey flows from a tributary stream, and restoration of surface contours to pre-erosional condition.

3.0 METHODOLOGY

3.1 LITERATURE REVIEW

Padre biologists reviewed available project design information, Humboldt County soil survey maps, National Wetland Inventory (NWI) Maps, the U.S. Geological Survey (USGS) 7.5-minute topographic map for the Arcata South quadrangle, and other environmental documents. The California Natural Diversity Database (CNDDDB) was queried for records of special-status species reported within a five-mile radius surrounding each of the project sites (California Department of Fish and Wildlife [CDFW], 2019). A list of federally listed Threatened and Endangered species was obtained from the U.S. Fish and Wildlife Service (USFWS), and is included under Appendix A (USFWS, 2019a). Special-status taxa that are known to exist or have the potential to exist on the project site were also identified through a review of relevant literature (California Native Plant Society [CNPS], 2017; Zeiner et al., 1988; 1990a, b).

3.2 FIELD RECONNAISSANCE SURVEY

Reconnaissance level field surveys for the purposes of site characterization were conducted by Padre biologists on October 29-31, 2018. Surveys were conducted to assess the potential for biological resources and to determine the likelihood of occurrence for special-status species and/or sensitive and regulated habitats on the site. Detection methods included direct observation with binoculars; examination and identification of tracks, scats, burrows/diggings, and carcasses/skeletal remains; and identification of vocalizations (calls and songs). No trapping or netting was performed during surveys. Plants not identified in the field were collected and returned to the lab for identification using standard taxonomic references (Baldwin et al., 2012). Prior to the field surveys, the CNDDDB query was reviewed to identify occurrences of special-status plant and animal species in the project vicinity (Appendix B). During the field surveys, vegetative cover types and significant habitat features, such as wetlands, potential nest trees, and potential dens or burrows, were noted. Lists of plants and wildlife associated with the various cover types were compiled and are included in Appendix C and D.

Field surveys to conduct preliminary aquatic resource delineations for the R-354 and RT-102 sites were conducted by Padre biologists December 11-13, 2018. A preliminary aquatic resource delineation was conducted for the R-519 site as part of another project (Stantec, 2017), and data from that effort was included in the biological resources technical study. Follow-up surveys to complete a delineation of the northern access route at R-354 and conduct tree surveys for all three sites were completed on July 17-19, 2019.

4.0 ENVIRONMENTAL SETTING

4.1 LOCATION

4.1.1 R-354 (Line 137B) Maintenance Project

The R-354 site is located on privately owned farm and pastureland east of Myrtletown in Humboldt County near the City of Eureka (Figure 1). The site is located in Section 19, Township 5 north, Range 1 east of the Arcata South U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (USGS, 1959). Figure 1 depicts the general site location and Project vicinity. The approximate coordinates for the pipeline crossing at Freshwater Slough are 40° 47' 44.63" N and 124° 07' 12.35" W. The site consists of undeveloped pasture lands, tidal wetlands, and disturbed areas associated with landowner farming practices. The site is bordered by residential development to the west and by grazing land to the north, south, and east. The site is zoned as Agricultural Exclusive and Natural Resources in the Humboldt County General Plan (Humboldt County, 2017).

4.1.2 R-519 (Line 137C) Maintenance Project

The R-519 site is located on privately owned farm and pastureland east of Myrtletown in Humboldt County near the City of Eureka (Figure 1). The site is located in Section 30, Township 5 north, Range 1 east of the Arcata South U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (USGS, 1959). Figure 1 depicts the general site location and Project vicinity. The approximate coordinates for the pipeline crossing at Ryan Slough are 40° 47' 6.26" N and 124° 07' 13.71" W. The site consists of undeveloped pasture lands, tidal slough, perennial channels, and disturbed areas associated with development. The site is bordered by residential development to the west and southeast and by grazing land to the north and northwest. The site is zoned as Agricultural Exclusive, Natural Resources, and/or Residential Low Density in the Humboldt County General Plan (Humboldt County, 2017).

4.1.3 RT-102 (Line 177A) Maintenance Project

The RT-102 site is located in the McKay Community Forest, owned and managed by Humboldt County. The site is located in Section 36, Township 5 north, Range 1 west of the Arcata South U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle. The proposed access route extends north from the site to Myrtle Road within a recently cleared PG&E easement. The access route occurs within two additional sections: Sections 30 and 31. Figure 1 depicts the general site location and Project vicinity. The approximate coordinates for the sinkhole repair location are 40° 46' 41.23" N and 124° 07' 17.30" W. The site consists of forested lands in Humboldt County, just south of the City of Eureka (Figure 1). The site is bordered on the north by Myrtle Road and on the east by Ryan Creek and pastureland beyond that, and forested land to the north and south. The site is zoned as Public Lands, Timberland, and Agricultural Exclusive in the Humboldt County General Plan (Humboldt County, 2017).

4.2 GEOLOGY/GEOMORPHOLOGY

The PG&E Maintenance project sites are all located within the Humboldt Bay Flats and Terraces subsection of the Northern California Coast ecological section of California (Miles and Goudey, 1997). The Humboldt Bay Flats and Terraces subsection occurs between the Pacific Ocean and the mountains of the northern California Coast Range. The geomorphology of this

subsection is low coastal plain and marine terraces. The elevation within this subsection ranges from sea level to about 1,000 feet, mean sea level (msl), and on the project sites, elevations range from approximately 10 to 70 feet msl. Fluvial erosion and deposition are the main geomorphic processes in the subsection and the resultant development and distribution of the four soil types that have been mapped by the Natural Resources Conservation Service (NRCS) across the three project sites.

All three sites are within the North Coast floristic subregion of the Northwestern California floristic region (Baldwin et al., 2012). The northern portion of the R-354 site is used as a pasture for grazing cattle. The topography of the pasture slopes towards the levee on the north side of Freshwater Slough and as a result tends to pond water at the toe of the levee. High groundwater table and potential levee seepage may also contribute to wet conditions at the toe of the levee. The southern portion of the R-354 site is a mix of natural tidal marsh habitat and disturbed lands. The site supports a variety of vegetation communities and wetland habitats discussed further in Section 4.6. A portion of the property is within a conservation easement as part of the U.S. Department of Agriculture (USDA) NRCS Wetland Reserve Program.

The portion of the R-519 site north and south of Myrtle Avenue is used as pasturelands for grazing. The site supports a variety of vegetation communities and wetland habitats as identified in the Preliminary Delineation of Waters of the United States Including Wetlands for the Gas Transmission Pipeline 137C Ryan Slough Crossing Replacement Project (Stantec, 2017). The vegetation communities and wetland habitat identified are discussed further in Section 4.6.

The access route to the RT-102 site is maintained as a PG&E pipeline easement, and adjacent lands within the study area support forested wetlands, wet meadows, and scrub-shrub wetlands. Several swale features are present along the access route that drain water from the adjacent hillside supporting redwood forest and arroyo willow thickets. A small channel that is tributary to Ryan Creek is located south of the sinkhole location. The RT-102 site supports a variety of vegetation communities and wetland habitats discussed further in Section 4.6.

4.3 CLIMATE

The project sites are situated in Climate Zone 17, which includes coastal areas of Northern California with marine effects (Clark, 1985). The sites have a climate that is strongly influenced by the Pacific Ocean. The climate is characterized by cool summers with frequent fog or wind and cool wet winters. Most of the rainfall occurs during the period from November through March.

On nearby Woodley Island, the average maximum temperature for the 133-year period between 1886 and 2018 was 58°F, with a range of 54.0° in January to 62.2° in September. The average minimum temperature was 46.6° with a range of 41.2° in January and 52.7° in August. The average annual precipitation is 39.19 inches with a range of 0.14 inch in July to 6.72 inches in December. On average, only 0.3 inches of the precipitation falls as snow (Western Regional Climate Center, 2019).

4.4 SOILS

The soils in the Humboldt Bay Flats and Terraces subsection generally have an isomesic and mesic soil temperature regime and mostly udic but sometimes aquic moisture regimes. A mesic soil temperature regime refers to soils with a mean annual temperature is 8° Celsius (C) or

higher but lower than 15°C. The difference between mean summer and mean winter soil temperatures is 6°C or more either at a depth of 50 cm below the soil surface or at a densic, lithic, or paralithic contact, whichever is shallower. A udic soil moisture regime refers to soil that is dry in all parts for less than 45 consecutive days in the 4 months following the summer solstice. In addition, the udic soil moisture regime requires, except for short periods, a three-phase system, solid-liquid-gas, in part or all of the soil when the soil temperature is above 5°C.

Based on a review and analysis of the U.S. Department of Agriculture's Web Soil Survey for Humboldt County (NRCS, 2018), the three project sites are underlain by Occidental, 0 to 2 percent slopes (map unit symbol 140), Weott, 0 to 2 percent slopes (map unit symbol 110), and Lepoil-Espa-Candymountain complex, 15 to 50 percent slopes (map unit symbol 258), and Water and Fluvents, 0 to 2 percent slopes (map unit symbol 100). These soil mapping units are described below.

4.4.1 Lepoil-Espa-Candy mountain complex, 15 to 50 percent slopes (258)

This soil mapping unit is comprised of three different inclusions. The Lepoil inclusion is a well-drained soil formed in mixed marine deposits derived from sedimentary rock. Typically, the soil profile is described from 0 to 35 inches as loam and from 35 to 67 inches as clay loam. Depth to a restrictive feature is typically more than 80 inches. Depth to the water table is about 49 to 59 inches. This mapping unit is classified as a non-hydric soil.

The Espa inclusion is a well-drained soil formed in mixed marine deposits derived from sedimentary rock. Typically, the soil profile is described from 0 to 41 inches as loam and from 41 to 60 inches as fine sandy loam. Depth to a restrictive layer is typically more than 80 inches. Depth to the water table is about 39 to 49 inches. This mapping unit is classified as a non-hydric soil.

The Candymountain inclusion is a well-drained soil formed in mixed marine deposits derived from sedimentary rock. Typically, the soil profile is described from 0 to 1 inches as slightly decomposed plant material, from 1 to 54 inches as fine sandy loam, and from 54 to 68 inches as fine sand. This mapping unit is classified as non-hydric.

This soil complex underlies portions of RT-102 that are defined by the redwood forest vegetation community. The matrix color in the upper six inches was 10YR 3/2 with ten percent concentration with a 7.5YR 4/4 color. From 6 to 18 inches the matrix color was a 2.5Y 4/1 with 20 percent concentrations with a color of 5YR 4/6.

4.4.2 Occidental, 0 to 2 percent slopes (140)

This soil mapping unit is a very poorly drained soil formed in alluvium derived from mixed sources. Typically, the soil profile is described from 0 to 3 inches as peat and from 3 to 63 inches as silty clay loam. Depth to a restrictive feature is typically more than 80 inches. Depth to the water table is 0 to 4 inches. This mapping unit is classified as a hydric soil and underlays most of the access route.

This soil mapping unit was the most common at the three repair sites. At R-354, all terrestrial areas are underlain by this soil. At R-519, this soil underlies the entire project area. Lastly, at RT-102 the middle section of the access route is underlain by this soil mapping unit. Typically, the observed texture consisted of a silt loam and silty clay loam. It had a matrix color of 10YR 3/2 in the upper three to five inches and 10YR 4/2 from three to five inches to the bottom

of the sample plot. In the second soil layer there were typically redox features with a color of 7.5YR 4/6. These features were located both in the matrix and pore linings along living roots. Some of the sample plots in this mapping unit had matrix colors of 2.5Y4/2 and 2.5Y4/1 in the second soil layer.

4.4.3 Water and Fluvents, 0 to 2 percent slopes (100)

This soil mapping unit is a somewhat excessively drained soil formed in alluvium derived from mixed sources. Typically, the soil profile is described from 0 to 13 inches as gravelly fine sand and from 13 to 59 inches as extremely gravelly sandy loam. Depth to a restrictive feature is typically more than 80 inches. Depth to the water table is 0 inches. This mapping unit is classified as a hydric soil and underlays the water at Freshwater Slough at the R-354 work site.

4.4.4 Weott, 0 to 2 percent slopes (110)

This soil mapping unit is a very poorly drained soil formed in alluvium derived from mixed sources. Typically, the soil profile is described from 0 to 60 inches as silt loam. Depth to a restrictive feature is typically more than 80 inches. Depth to the water table is about 0 to 4 inches. This mapping unit is classified as a hydric soil and underlays portions of RT-102 that are adjacent to Ryan Creek.

The soils in these locations generally had a very dark gray to dark brownish gray matrix color with chromas and values of 3/2, 4/2, and 4/1 being present. All pits dug in this soil mapping unit had redox concentrations, with the color 10YR 4/6 being the most commonly observed.

4.5 WATER QUALITY

Water quality is an important factor in determining habitat suitability for special-status fish species, specifically salmonids. Water temperature in lower Freshwater Slough and Ryan Slough is typically too high to support salmonids during the late summer months, with water temperatures regularly exceeding 64° Fahrenheit (F) (18° Celsius [C]). Typically, salmonids prefer cool streams and rivers with a maximum temperature of 64° F (18°C). High water temperatures result in reduced levels of dissolved oxygen, which can impact growth and development of all life stages of salmonids. Salmon have been documented to have an avoidance response to unfavorable dissolved oxygen levels (Carter, 2005). Salmonid behavioral response when temperatures become too high will be to go upstream to locations where conditions are more favorable.

Water quality data collected in the Freshwater Creek watershed for a CDFW Natural Stocks Assessment (NSA) Project conducted in 2003 studying juvenile salmonid use of Freshwater Slough and the tidal portion of Freshwater Creek was used as an indication of typical water temperatures at the three pipeline maintenance sites during spring and summer months. Two of the water quality sampling stations sampled in this study provided data that was relevant to the pipeline maintenance sites. The "Pipe Station" is located on Freshwater Slough between the R-354 site and the R-519 site. This NSA study did not include a water quality monitoring station on Ryan Creek; however, the "Bend Station" is approximately the same distance upstream on Freshwater Creek as the RT-102 site is on Ryan Creek and can be used as an analogy. Although sampling events were only conducted between April and August, the data shows the progression of increased water temperatures recorded in summer months (Wallace, 2006). Table 1 presents water temperature data collected in the 2003 NSA study.

Table 1. Water Temperature Data Recorded in Freshwater Slough System in 2003

Sampling Station	Date and Temperature				
	April 16	May 15	June 19	July 7	August 19
"Pipe" Station	50°F (10°C)	59.5°F (15.3°C)	66.4°F (19.1°C)	64.7°F (18.2°C)	71.6°F (22°C)
"Bend" Station	49.8°F (9.9°C)	55.4°F (13°C)	68.7°F (20.4°C)	66.4°F (19.1°C)	72.8°F (22.7°C)
Source: Wallace, 2006.					

Water temperature data was not available for CDFW NSA studies conducted between 2005 and 2009; however, the NSA sampling included the deployment of HOBO temperature data loggers in Freshwater Creek Slough to continuously measure spring to fall winter temperatures in estuarine habitat. While raw data was not provided, the final reports for the NSA studies provided a summary of the water quality data collected. HOBO meter data collected between 2005 and 2009 indicate that water temperatures in the freshwater portion of the system (upstream of the pipeline maintenance sites) did not exceed 62.5-64.5°F (17-18°C), even during summer months. However, within the lower Freshwater Slough (a 3.1 mile [5 km] stretch including Freshwater Slough and Ryan Slough) NSA recorded water temperatures routinely exceeding 68°F (20°C), and up to 78.8°F (26°C) during late summer months. Temperatures almost always remained above 68°F (20°C) from mid-June through mid-August regardless of tide stage or time of day (Wallace and Allen, 2007; Wallace and Allen, 2009). The elevated temperatures in lower Freshwater Creek/Slough are likely due to extensive mudflats surrounding this area that absorb heat at low tide and transfer heat to slough water as it rises over the mudflats with incoming tides. The lack of water circulation within the leveed portions of the slough traps the warm water in lower Freshwater Slough (Wallace and Allen, 2007; Wallace and Allen, 2009).

Higher water temperatures routinely observed in lower Freshwater Slough during summer months indicate inhospitable habitat conditions for salmonid species, a low likelihood of occurrence of salmonids near the pipeline maintenance sites during summer months and supports the seasonal in-water work window of July 1 to October 15, intended for avoidance of listed fish species.

4.6 HABITAT DESCRIPTIONS AND VEGETATION

The project sites are located generally east of the City of Eureka. The surrounding area consists of residential development west of the sites, Humboldt Bay north of the sites, pasturelands northeast and east of the sites, and forested lands south and southwest of the sites. All of the project sites are within the Freshwater Slough / Ryan Creek watershed.

The project sites occur within a variety of habitats. A brief description of each of the habitat types identified within the greater project area is provided. Table 2 summarizes the vegetation communities identified at each site. Plant species lists are provided for each of the PG&E Pipeline Maintenance Sites in Appendix C. Vegetation Communities mapped for each site are include in Figures 2-1 through 2-3.

Table 2. Vegetation Communities Located at the PG&E Pipeline Maintenance Project Sites

Vegetation Community	PG&E Maintenance Site		
	R-354 (L-137B) Freshwater Slough	R-519 (L-137C) Ryan Slough	RT-102 (L-177A) Ryan Creek
Annual Brome Grasslands		X	
Arroyo Willow Thicket		X	X
Baltic Rush Marsh		X	
Bentgrass-Tall Fescue Meadow		X	X
Chilean Cordgrass Marsh	X		
Coastal Brambles	X		
Common Velvet Grass-Sweet Vernal Grass Meadows	X	X	
Douglas-Fir Forest		X	
Duckweed Bloom			X
Grand Fir Forest			X
Himalayan Blackberry Brambles	X	X	
Monterey Cypress Stands	X		
Perennial Rye Grass Fields	X	X	
Pickleweed Mats	X	X	
Red Alder Forest			X
Redwood Forest		X	X
Salt Grass Flats	X		
Slough Sedge Swards			X
Small-fruited Bulrush Marsh			X
Soft Rush Marsh		X	X
Tufted Hairgrass Meadow	X		
Water Foxtail Meadows	X	X	
Disturbed Area	X	X	X
Ornamental			X

4.6.1 Annual Brome Grassland

Annual brome grasslands are common throughout foothills and rangelands as well as in the openings of woodlands. This community can be found from 0 to approximately 7,200 feet in elevation. The typical non-native grasses that make up this cover type include ripgut grass (*Bromus diandrus*), soft cheat (*Bromus hordeaceus*), and false brome (*Brachypodium distachyon*). Various non-native forbs like mustards (*Brassica* sp.) may also be co-dominant in the herbaceous layer. This community was found adjacent to several roadsides and highly disturbed areas at the R-519 site and could be considered Disturbed Lands.

4.6.2 Arroyo Willow Thicket

Arroyo willow thickets are typical along temporarily flooded stream banks and can be found throughout most of California at elevations ranging from 0 to 7,100 feet in elevation. This freshwater emergent wetland is characterized by stands of arroyo willow (*Salix lasiolepis*). Other riparian trees like Fremont cottonwood (*Populus fremontii*) and California sycamore (*Platanus racemosa*) can also be found in this cover type. This community was present in the riparian habitat along Ryan Creek and in several locations along the access route at the RT-102 project site. This community was also on the banks of Ryan Slough near the Myrtle Avenue bridge crossing at the R-519 project site.

4.6.3 Baltic Rush Marsh

Baltic rush marshes are found in wet areas along streams, lakes, and ponds. They are also found in both freshwater and brackish marshes and range from 0 to 7,200 feet in elevation. This herbaceous emergent wetland is dominated by Baltic rush (*Juncus balticus* spp. *ater*). At the R-519 project site, Baltic rush was associated with gumplant (*Grindelia* sp.), perennial rye grass (*Festuca perennis*), and silverweed (*Potentilla anserina*). Baltic rush marshes occur just outside the Ordinary High Water Mark (OHWM) of Ryan Slough, along the edges of the channel (Stantec, 2017).

4.6.4 Bentgrass-Tall Fescue Meadow

Bentgrass-tall fescue meadows are found in seasonally flooded brackish marshes, meadows, stream terraces, wet pastures, or agricultural wetlands at elevations ranging from 0 to 3,280 feet. This semi-natural herbaceous community is characterized by a dominance of creeping bentgrass (*Agrostis stolonifera*) and tall fescue (*Festuca arundinacea*). Both of these plants are nonnative perennial grasses in the Poaceae or grass family. Both grasses are listed in the California Invasive Plant Council (Cal-IPC) inventory; creeping bentgrass has a rating of limited (i.e., invasive but their ecological impacts are minor on a statewide level) and tall fescue has a rating of moderate (i.e., substantial and apparent [but generally not severe] ecological impacts on physical processes, plant and animal communities, and vegetation structure). Plant associates were comprised of mostly nonnative species including California burclover (*Medicago polymorpha*) and white clover (*Trifolium repens*). This community was mapped at all three sites.

At the R-354 site, this semi-natural stand was found on top of the levee along the northern bank of Freshwater Slough. Along the length of the levee there were numerous native and non-native herbaceous species that comprised the associate species of the bentgrass-tall fescue meadow. In addition to the co-dominant species, some of the more common plants that were found in this community included coastal gumplant (*Grindelia stricta* var. *stricta*), velvet grass (*Holcus lanatus*), curly dock (*Rumex crispus*), radish (*Raphanus sativus*), and yarrow (*Achillea millefolium*).

At the R-519 site, this semi-natural stand was prevalent within pastureland north of Myrtle Avenue. Creeping bentgrass and tall fescue were codominant in a continuous herbaceous layer. Plant associates were comprised of mostly nonnative species including knotweed (*Polygonum aviculare*), pennyroyal (*Mentha pulegium*), California burclover, pineapple weed (*Matricaria discoidea*), hyssop loosestrife (*Lythrum hyssopifolia*), and toad rush (*Juncus bufonius*) (Stillwater Sciences, 2018).

At the RT-102 site, this semi-natural stand was mapped north of the sinkhole location by Stillwater Sciences during rare plant surveys conducted in June 2018 (Stillwater Sciences, 2018). Due to the vegetation removal prior to December 2018 surveys, Padre biologists could not verify dominant and associate plant species at this location; therefore, the previously mapped vegetation cover was used.

4.6.5 Chilean Cordgrass Marsh

Chilean cordgrass marshes can be found in coastal saltmarshes and mudbanks, typically in bays at sea level. This semi-natural herbaceous community is characterized by a dominance of dense-flowered cordgrass [Chilean cordgrass] (*Spartina densiflora*). This non-native cordgrass has a Cal-IPC invasive rating of high and can form dense monocultures and outcompete other native tidal marsh species. This community was only mapped at the R-354 site. Within the study area at R-354, this community dominated the peninsula that is tidally inundated on the south bank of Freshwater Slough. It was also present along the north bank of Freshwater Slough in small pockets. Associate species that were present include seaside arrowgrass (*Triglochin maritima*) and pickleweed (*Salicornia pacifica*).

4.6.6 Coastal Brambles

Coastal brambles often occur on exposed slopes and in gaps of forest stands. This coastal scrub cover type is characterized by a dominance of California blackberry (*Rubus ursinus*). Typically, a dense shrub layer allows for very little herbaceous cover to develop. This community was found at R-354 on the slopes of the disturbed area located in the southern portion of the study area. In this community the California blackberry had nearly 100 percent cover with the exception of a path where blackberry had been removed. On this path, there were a few sparse herbs characteristic of disturbed areas including radish and bristly ox-tongue (*Helminthotheca echioides*).

4.6.7 Common Velvet Grass-Sweet Vernal Grass Meadows

Common velvet grass-sweet vernal grass meadows can be found on coastal bluffs and terraces as well as moist pastures at elevations ranging from 0 to 7,550 feet. This herbaceous community is characterized by a dominance of common velvet grass and sweet vernal grass (*Anthoxanthum odoratum*) which are both nonnative perennial grasses in the Poaceae family with have a moderate weed rating from Cal-IPC. This community was found at the R-354 and R-519 sites.

At the R-354 site, this semi-natural stand was located along the top of the levee on the north bank of Freshwater Slough. Herbaceous plant associates identified include bentgrass, tall fescue, coastal gumplant, curly dock, wild radish, and yarrow.

At the R-519 site, this semi-natural stand was located on the top of the levee and the landward slope of the levee. Associate species include Queen Anne's lace (*Daucus carota*), English plantain (*Plantago lanceolata*), birds-foot trefoil (*Lotus corniculatus*), cutleaf geranium (*Geranium dissectum*), English daisy (*Bellis perennis*), common selfheal (*Prunella vulgaris*), and tall fescue (Stillwater Sciences, 2018).

4.6.8 Douglas-Fir Forest

Douglas-fir forests primarily occur at elevations ranging from 2,300 to 4,600 feet and can thrive in a variety of site conditions. This coniferous forest is characterized by a dominance of Douglas-fir (*Pseudotsuga menziesii*) in the tree canopy. There are a variety of other hardwood trees that can be codominant or associate species in this community. Some of these species include white fir (*Abies concolor*), Pacific madrone (*Arbutus menziesii*), incense cedar (*Calocedrus decurrens*), lodgepole pine (*Pinus contorta*), Jeffery pine (*Pinus jeffreyi*), canyon live oak (*Quercus chrysolepis*), and coast redwood (*Sequoia sempervirens*). This community was present on the western side of the R-519 site and was isolated to a hillslope bordered by a driveway.

4.6.9 Duckweed Bloom

Duckweed blooms can occur on seasonal or perennial freshwater bodies throughout much of California ranging from 0 to approximately 7,550 feet in elevation. This emergent freshwater wetland is characterized by the presence of duckweed (*Lemna* sp.) on the surface of the water, often covering the entire surface. Other wetland plants including naked-stem bulrushes (*Schoenoplectus* sp.) and cattails (*Typha* sp.) may also be present in the water body. This community was only found on the RT-102 site. It was located on a small pond perched on the western side of the access route.

4.6.10 Grand Fir Forest

Grand fir forests typically occur on maritime terraces and coastline slopes and bluffs. This forest alliance is relatively rare along California's North Coast starting in Sonoma County and can be found at elevations ranging from 0 to 165 feet. It is characterized by a dominance of grand fir (*Abies grandis*) in the tree stratum. Other tree species that are commonly found in grand fir forests include red alder (*Alnus rubra*), Sitka spruce (*Picea sitchensis*), coast redwood, and western hemlock (*Tsuga heterophylla*). This community was mapped at the RT-102 site where a small stand of grand fir was located on the eastern side of the access route just south of Myrtle Avenue.

4.6.11 Himalayan Blackberry Brambles

Himalayan blackberry brambles can be found in a variety of fringe habitats including pastures, roadsides, stream sides, river flats, fence lines, and right-of-way corridors. This shrubland community can be found at elevations ranging from 0 to 5,250 feet. The dominant shrub in this community is Himalayan blackberry (*Rubus armeniacus*). Himalayan blackberry is a nonnative shrub in the Rosaceae family and has a Cal-IPC rating of high. This community was found at the R-354 site and the R-519 site.

At the R-354 project site, this cover type was present along the fence line of the northern pasture and on the top of a berm present on the south side of the study area separating the tidal waters from the southern portion of the property. There was limited species diversity at these locations with isolated coyote brush (*Baccharis pilularis*) and Scotch broom (*Cytisus scoparius*) shrubs present on the southern berm. California blackberry was also mixed in the brambles but was not considered a dominant species.

At the R-519 site, this cover type was distributed in patches within upland regions of the levees surrounding Ryan Slough where it was intermixed with the Common velvet grass-sweet vernal grass meadows community. Associate species at this site were primarily grasses and

herbaceous forbs such as sweet vernal grass, common yarrow, and scattered coyote brush shrubs (Stillwater Sciences, 2018).

4.6.12 Monterey Cypress Stands

Monterey cypress stands are typically found in sheltered areas near the coast with soils derived from granite. They occur at elevations between 0 and 330 feet. This forest community is characterized by a dominance of Monterey cypress (*Hesperocyparis macrocarpa*) in the tree layer. There are only two populations of Monterey cypress left on the Monterey Peninsula and the tree is considered a CNPS List 1B.2 species in its native range. Outside of its native range, the Monterey cypress has invasive tendencies and it is relatively common along California's coastline. This community occurs at the R-354 site where a small stand of Monterey cypress is present along the driveway and disturbed area on the southern portion of the site. The linear pattern of the stand's development suggests that these trees were planted ornamentally. In the under story of the stand were various grasses and herbs including velvet grass, curly dock, orchard grass (*Dactylis glomerata*), and hairy willow herb (*Epilobium ciliatum*).

4.6.13 Perennial Rye Grass Fields

Perennial rye grass fields are found in lowlands, disked fields, and vernal pool landscapes, often in areas where periodic flooding occurs. Perennial rye grass fields are found from 0 to approximately 3,300 feet in elevation. These annual grasslands are characterized by a dominance of perennial rye grass. Other herbs and grasses are often found in this cover type including: ripgut grass, soft cheat, wild oats (*Avena fatua*), black mustard (*Brassica nigra*), and narrow-leaved milkweed (*Asclepias fascicularis*). Perennial rye grass fields are not heavily used by wildlife for forage and typically occur on nutrient-poor soils.

This community occurs at the R-354 site and the R-519 site. This semi-natural herbaceous community occurs in the pastureland on the north side of Freshwater Slough at the R-354 project site. Some portions of the rye grass field were co-dominated by birds-foot trefoil and others by salt grass. At the R-519 site, this cover type was present along the top of the southeastern levee that borders Ryan Slough (Stantec, 2017).

4.6.14 Pickleweed Mats

Pickleweed mats are found in coastal salt marshes and alkali flats along many parts of coastal California and in the San Francisco Bay Area. They can be found at a narrow range of elevations from 0 to approximately eight feet msl. The dominant plant in the herbaceous layer is pickleweed although fat-hen and rush (*Juncus* sp.) and are often found as associates in this community.

This community occurs at the R-354 site and the R-519 site. At R-354, pickleweed mats were mapped in a sparsely vegetated depression at the toe slope of the north levee where water ponds for long periods of time. At R-354, the co-dominant plant in this community was dense-flowered cord grass.

At the R-519 site, occurs along the banks of Ryan Slough with variable percent cover. Associate species at this site include common arrow-grass, fleshy jaumea, salt grass, fat-hen, annual beard grass (*Polypogon monspeliensis*), meadow barley (*Hordeum brachyantherum*), and coastal gumplant. The invasive dense-flowered cordgrass also occurred throughout this community at the R-519 site (Stillwater Sciences, 2018).

4.6.15 Red Alder Forest

Red alder forests can be found coastally along stream and riverbanks, bottoms, floodplains, mouths, and terraces at elevations ranging from 0 to 2,460 feet. This forest community is characterized by a tree canopy dominated by red alder. This community was only observed at the RT-102 site. It occurs in patches along the access route and west of the sinkhole location. The understory included California blackberry, stinging nettle (*Urtica dioica*), Mexican hedgenettle (*Stachys mexicana*), goose grass (*Galium aparine*), and Himalayan blackberry. This alliance is associated with riparian woodland and riparian forest habitats.

4.6.16 Redwood Forest

Redwood forests occur coastally along raised stream terraces and benches as well as a variety of slopes and ridges. This community can be found at elevations ranging from 30 to 3,200 feet. The dominant tree in this forest community is the redwood. Redwood is a native conifer in the Cupressaceae family. Other tree species that commonly make up the canopy of redwood forests include Douglas-fir and Sitka spruce. The tree canopy is usually continuous with a sparse shrub layer of California huckleberry (*Vaccinium ovatum*), red huckleberry (*Vaccinium parvifolium*), twinberry (*Lonicera involucrata*), and red elderberry (*Sambucus racemosa*) and moderate herbaceous layer of western brackenfern (*Pteridium aquilinum* var. *pubescens*), western swordfern (*Polystichum munitum*), leather-leaf fern (*Polypodium scolieri*), Douglas iris (*Iris douglasiana*), broadleaf starflower (*Trientalis latifolia*), and Mexican hedgenettle (*Stachys mexicana*). This community was mapped at the R-519 site and the RT-102 site. At the R-519 site, this alliance occurred immediately adjacent to Myrtle Avenue (Stillwater Sciences, 2018). At RT-102, the redwood forest alliance occurred in patches along the edge of the access route.

4.6.17 Salt Grass Flats

Salt grass flats can be found along the entire California coast in coastal salt marshes as well as inland swales that are intermittently flooded and provide a saline environment. Salt grass flats can be found at elevations ranging from 0 to approximately 4,900 feet in elevation. This saline emergent wetland is characterized by a dominance of salt grass in the herbaceous layer although it may be accompanied by a variety of other plants including saltbushes (*Atriplex* sp.), and ragweeds (*Ambrosia* sp.). This community was only present at the R-354 site in a transitional area between the perennial rye grass field and the pickleweed mat in the northern pasture. The herbaceous cover was almost entirely comprised of salt grass although other hydrophytic species like annual beard grass and pickleweed grew in portions of the community.

4.6.18 Slough Sedge Swards

Slough sedge swards can be found in a variety of wetland environments including seasonally flooded swales, shallowly inundated woods, meadows, roadside ditches, coastal swamps, lakeshores, marshes, and riverbanks. This herbaceous community typically occurs at elevations ranging from 0 to 2,950 feet. It is characterized by a dominance of slough sedge (*Carex obnupta*). Slough sedge is a native perennial sedge in the Cyperaceae family. This herbaceous alliance only occurred at the RT-102 site and was located in several patches along the access route. Plant associates included stinging nettle and soft rush (*Juncus effusus*).

4.6.19 Small-fruited Bulrush Marsh

Small-fruited bulrush marshes can be found in seasonally flooded marshes, stream sides, and roadside ditches at elevations ranging from 0 to 9,200 feet. The dominant plant in this herbaceous community is the small-fruited bulrush (*Scirpus microcarpus*). The small-fruited bulrush is a native perennial sedge in the Cyperaceae family. This herbaceous alliance only occurred at the RT-102 site and was identified in isolated patches along the access route. Plant associates included soft rush, water parsley (*Oenanthe sarmentosa*), creeping buttercup (*Ranunculus repens*), iris-leaf rush (*Juncus xiphioides*), pennyroyal, and coastal monkeyflower (*Erythranthe dentata*).

4.6.20 Soft Rush Marsh

Soft rush marshes can be found in stock ponds, minor depressions, wet meadows, and seeps at elevations ranging from 0 to 4,250 feet. The characteristic herb that dominates this community is soft rush. Soft rush is a native perennial grass-like herb in the Juncaceae family. This community was observed at the R-519 site and the RT-102 site.

At the R-519 site, this alliance forms a large stand within the pasture north of Myrtle Avenue. Associate species at this location include perennial rye grass, water foxtail (*Alopecurus geniculatus*), and waxy manna grass (*Glyceria declinata*). In low depressions and deeper ditches, small patches of emergent vegetation occurred including small-fruited bulrush, water parsley, water cress, American brooklime (*Veronica Americana*), brass buttons, common spikerush (*Eleocharis palustris*), and floating marsh pennywort (*Hydrocotyle ranunculoides*) (Stillwater Sciences, 2018).

At the RT-102 project site, this herbaceous community was found in a small patch along the eastern edge of the access route. Plant associates include perennial rye grass, small-fruited bulrush (*Scirpus microcarpus*), and water parsley.

4.6.21 Tufted Hairgrass Meadow

Tufted hair grass meadows can be found coastally on bluffs, terraces, sand dunes, and seasonally flooded areas or in montane to alpine wet meadows. This herbaceous community can be found at elevations ranging from 0 to 12,800 feet. This community is characterized by a dominance of the native tufted hair grass (*Deschampsia caespitosa*). In coastal environments there are several other herbaceous species that can be found as associates in this community. Some of these species include California bentgrass (*Agrostis densiflora*), salt grass, and fat-hen. This community was only mapped at the R-354 site where it occurred between the southern berm and the disturbed area in the southern portion of the study area. Associates species noted at the site included California bentgrass, fat-hen, and brass buttons and a small patch population of fat-hen and brass buttons was included in this community.

4.6.22 Water Foxtail Meadow

Water foxtail meadows can be found in valley bottoms, wet meadows, and stream terraces at elevations ranging from 0 to 5,100 feet. This herbaceous community is characterized by a dominance of water foxtail (*Alopecurus geniculatus*). Water foxtail is a native perennial grass in the Poaceae family. This alliance was observed at the R-354 and R-519 sites.

Within the study area at the R-354 site, this community was present within depressions along the farm road leading to the northeast. In these depressions, associate species identified include brass buttons (*Cotula coronopifolia*), creeping spikerush (*Eleocharis macrostachya*), annual beard grass, and fat-hen (*Atriplex prostrata*).

At the R-519 site it occurred in low depressions and irrigation ditches subject to ponding in the pasture fields. Associate species at this location include waxy manna grass, buttercup (*Ranunculus* sp.), and lesser duckweed (*Lemna minor*) (Stillwater Sciences, 2018).

4.6.23 Disturbed Lands

This community is not described in the *Manual of California Vegetation Second Edition* as it is an unnatural community. Disturbed areas can be extremely variable in species composition and vegetative cover, but they are often associated with non-native weedy species that tolerate disturbed conditions. Disturbed vegetation was present at all three project sites. At the R-354 site, disturbed vegetation occurred in two locations on the south side of Freshwater Slough. At the R-519 site, disturbed areas occurred primarily along roadways, and at the RT-102 site, disturbed areas were present along the length of the access route where vegetation removal had recently occurred.

4.6.24 Ruderal/Ornamental

This community is not described in the *Manual of California Vegetation Second Edition* as it is not a naturalized community. There are a wide variety of ornamental plants that can occur in ruderal or ornamental areas. Most are non-native and are planted for their aesthetic or practical applications. This community was only mapped at the RT-102 site where it was present at the northern-most limits of the access route where the access route crosses a residential property to connect to Myrtle Avenue.

4.7 WATERS AND WETLANDS

The PG&E Pipeline Maintenance Project sites were examined for evidence of regulated habitats, such as waters and wetlands, under regulatory authority of the U.S. Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899. Preliminary Aquatic Resource Delineations were conducted for each of the three sites. The Preliminary Aquatic Resource Delineations identified and delineated the geographic extent of Federal jurisdictional waters of the U.S. and wetlands, State-defined wetlands (coastal zone wetlands), and other features under State jurisdiction (Appendix E).

4.7.1 R-354 (Line 137B) Maintenance Project

During field survey efforts conducted in December 2018 and July 2019, Padre identified a total of 3.65 acres of Federal jurisdictional waters and wetlands, 5.35 acres of State-defined wetlands, 3.65 acres of waters of the State, and 1.49 acres of stream features within the 7.20-acre study area at the R-354 site. Activities within these delineated areas are regulated by the Federal government and/or the State of California. Refer Appendix E for the Preliminary Federal Aquatic Resources Delineation and State-Defined Wetlands Delineation Report for the R-354 site.

Freshwater Slough is a Navigable Waterway under Section 10 of the Rivers and Harbors Act of 1899 and a Water of the U.S. under Section 404 of the Clean Water Act and is subject to Corps jurisdiction. Adjacent lands meeting the three-parameter definition of a federal wetland are

also Corps jurisdictional under Section 404 of the Clean Water Act. Lands meeting the one-parameter definition (hydrophytic vegetation, hydric soil, or wetland hydrology) of a State-defined wetland are regulated by the CCC. Freshwater Slough and adjacent wetlands also meet the definition of waters of the state defined within the Porter-Cologne Water Quality Control Act to include any surface water or groundwater, including saline waters, within the boundaries of the state and regulated by the North Coast Regional Water Quality Control Board (NCRWQCB). The bed, bank, and floodplain of Freshwater Slough is also regulated under Section 1600 of the California Fish and Game Code administered by the CDFW.

Within the R-354 study area there are several wetland types and other waters present. These different wetland types are defined both by their abiotic features such as water regime and topography as well as biotic factors like vegetation communities. The two wetland types found within the study area include tidal marsh and wet meadow. Other Waters of the U.S. present at in the study area are classified as tidal waters (Freshwater Slough). Wetland types were determined by the aforementioned abiotic and biotic factors and the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, 1979). Below is a brief description of each wetland type and of the other waters present in the study area.

4.7.1.1 Tidal Marsh (Wetland)

Tidal marshes are a type of emergent wetland which is part of the palustrine wetland classification. They are present along the coastline where waters are influenced by the motion of ocean tides. Tidal marshes can be fresh, brackish, or saline. These wetland habitats can be broken down into two zones, the intertidal marsh and the upper marsh. Tidal marsh zones are determined based on species composition and the amount of tidal inundation that occurs. Within the study area, the wetland feature on the peninsula on the south side of Freshwater Slough (mapped as W2) is a tidal marsh dominated by pickleweed and common arrow-grass. A total of 0.20-acre of tidal marsh wetlands occur within the R-354 study area.

4.7.1.2 Wet Meadow (Wetland)

Wet meadows are a type of emergent wetland that is part of the palustrine wetland classification. Wet meadows have a dominance of non-woody herbaceous plant species and are typically found in poorly drained areas where water will sometimes pond during high seasonal precipitation. Emergent wetlands are divided into two subclasses, persistent and nonpersistent. Wet meadows are a persistent emergent wetland because the herbaceous species that dominate them are visible above the soil or water surface year-round. Wet meadows often resemble grasslands and they lack standing water for most of the year. There are a wide variety of hydrophytic plants that can inhabit a wet meadow. Within the study area, two wet meadow features were present (mapped as W1 and W3). Feature W1 is located in the pasture in the northern portion of the study area and sample plots were sited along a transect that was representative of the entire feature. This wetland had a variety of hydrophytic species including rye grass, Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), and bird's foot trefoil consistently present throughout the feature. Feature W3 is located on the south side of Freshwater Slough south of the upland berm that separates the tidal marsh from the wet meadow. W3 appears to be more strongly influenced by wetland hydrology as the dominant species there included tufted hairgrass, salt grass, and fat-hen. A total of 2.36 acres of wet meadow occur within the R-354 study area.

4.7.1.3 Tidal Waters (Waters of the U.S.)

Tidal waters can belong to a variety of wetland classifications including marine, riverine, and estuarine. Determining which classification, a site's tidal waters belong to involves identifying the geomorphologic characteristics of the site. A marine system consists of open ocean and is associated with high-energy coastlines. Estuarine systems consist of deepwater tidal habitat and the adjacent tidal wetlands that are influenced by ocean salinity but are diluted from freshwater flow. The riverine system is defined by the presence of wetlands and/or deepwater habitat contained within a channel feature. Within the study area, the tidal waters present are in Freshwater Slough and are contained within a channel making them part of the riverine classification. Within the riverine system classification are four subsystems. These are tidal, lower perennial, upper perennial, and intermittent. The tidal riverine subsystem is classified by its low flow and the ocean derived salt concentration reaches 0.5 ppt during periods of average annual low flow. This subsystem usually has a muddy stream bottom due to the fine particulates settling out of the water column in low flows. In a tidal system, the limits of Corps jurisdiction on waters of the U.S. are defined by the mean high tide lines. See the Preliminary Resources Aquatic Delineation Map (Appendix E) for the location of the mean high tide lines on Freshwater Slough. A total of 1.06 acre of tidal waters occur within the R-354 study area.

4.7.1.4 Nontidal Waters (Waters of the U.S.)

Nontidal waters can belong to a variety of wetland classifications including palustrine, lacustrine, and riverine. Within these classifications, the ecosystem can exist beyond the influence of oceanic tides. Determining which classification, a site's nontidal waters belong to involves identifying the geomorphologic characteristics of the site. A palustrine system is characterized as all nontidal wetlands with a dominance of some sort of emergent vegetation and less than 0.5 parts per thousand of ocean-derived salts. Palustrine systems can lack vegetation if they are less than 20 acres in size, have less than 0.5 parts per thousand of ocean-derived salts, are no more than 2 meters deep at low water level, and lack wave-formed bedrock formations on the shoreline. Lacustrine systems are defined by three major characteristics. The system must occur within a depression or dammed river, must be greater than 20 acres in size, and have less than 30% aerial coverage of trees, shrubs, or emergent vegetation. The riverine system is defined by the presence of wetlands and/or deepwater habitat contained within a channel feature. Within the study area, the nontidal waters present are in a portion of Fay Slough that is cut-off from tidal action due to the presence of earth berms which appear to lack culverts and/or tide gates. These waters are contained within a channel making them part of the riverine classification. Within the riverine system classification there are four subsystems. These are tidal, lower perennial, upper perennial, and intermittent. The nontidal wetlands on this site consist of a lower perennial subsystem, which is classified by its low gradient and velocity as well as a lack of tidal influence. Lower perennial subsystems typically have year-round flow and have a substrate of sand and mud. In a nontidal system, the limits of Corps jurisdiction on waters of the U.S. are defined by an OHWM. Nontidal waters may support in-channel or adjacent wetlands, which would also be Corps jurisdictional if they meet the three-parameter approach to wetland delineation. The nontidal waters within the study area did support in channel wetlands and is also mapped as W7. See the Preliminary Resources Aquatic Delineation Map (Appendix E) for the location of nontidal waters (W7). A total of 0.02 acre of nontidal waters occur within the R-354 study area.

4.7.2 R-519 (Line 137C) Maintenance Project

A preliminary delineation of Federal jurisdictional waters of the U.S. and wetlands was previously conducted for this site (Stantec, 2017). Field datasheets were completed as part of the 2017 surveys conducted for this site, and Padre conducted a brief site inspection to confirm current site conditions. Jurisdictional acreages used for this site are largely based on the datasheets prepared in support of the Preliminary Delineation of Waters of the United States, Including Wetlands (Stantec, 2017). Padre biologists conducted two brief site visits in October and December 2018 to confirm that site conditions had not substantially changed since the 2017 surveys were completed.

A total of 31.29 acres of Federal jurisdictional waters and wetlands was identified within the 37.9-acre study area at the R-519 site as a result of the 2017 surveys (Stantec, 2017). A total of 33.84 acres of State-defined wetlands, 30.42 acres of waters of the State, and 5.13 acres of stream features were identified within the 37.9-acre study area as a result of Padre's review and analysis of the delineation data collected in 2017. Activities within these delineated areas are regulated by the Federal government and/or the State of California. Refer to Appendix E for the Preliminary Federal Aquatic Resources Delineation and State-Defined Wetlands Delineation Report for the R-519 site.

Within the R-519 study area there are several wetland types and other waters present. These different wetland types are defined both by their abiotic features such as water regime and topography as well as biotic factors like vegetation communities. The two wetland types found within the study area include wet meadow and willow riparian scrub. Other Waters of the U.S. present at in the study area are classified as perennial channel (Ryan Slough) (Stantec, 2017). Wetland types were determined by the aforementioned abiotic and biotic factors and the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, 1979). Below is a brief description of each wetland type and of the other waters present in the study area.

4.7.2.1 Wet Meadow (Wetland)

Wet meadows are a type of emergent wetland that is part of the palustrine wetland classification. Wet meadows have a dominance of non-woody herbaceous plant species and are typically found in poorly drained areas where water will sometimes pond during high seasonal precipitation. Emergent wetlands are divided into two subclasses, persistent and nonpersistent. Wet meadows are a persistent emergent wetland because the herbaceous species that dominate them are visible above the soil or water surface year-round. Wet meadows often resemble grasslands and they lack standing water for most of the year. There are a wide variety of hydrophytic plants that can inhabit a wet meadow. Within the R-519 study area, two large meadows make up most of the wetland acreage on site (W-14, W-15) north of Myrtle Avenue, and one south of Myrtle Avenue (W-18). All three meadows are used for grazing livestock and the assemblage of plants, or perennial rye grass fields are a result of intentional planting for pasture. W-14 and W-15 are used to graze cattle and were heavily grazed at the time of the survey. W-18 is used to graze horses and is a mosaic of wet meadow and perennial emergent marsh wetland. They receive precipitation, tidal flows, subsurface flows, and runoff from the surrounding area (Stantec, 2017). A total of 19.8 acres of wet meadow occur within the R-519 study area (Stantec, 2017).

4.7.2.2 Willow Shrub Scrub (Wetland)

Scrub-shrub wetlands are a class of palustrine wetland that are defined by a dominance of woody plants that are less than twenty feet tall. An immature forested wetland can be considered a scrub-shrub wetland if the trees in the community have not yet reached a height of 20 feet. As a result, there are a wide variety of plant species that can occur in a scrub-shrub wetland. Within this class of wetland, there are five subclasses that further refine the type of system present. These subclasses are broad-leaved deciduous, needle-leaved deciduous, broad-leaved evergreen, needle-leaved evergreen, and dead.

Within the R-519 study area, willow riparian scrub wetlands occur along either bank of Ryan Slough in the western portion of the study area near the Myrtle Avenue bridge crossing. This wetland community supports a tree and shrub canopy dominated by arroyo willow (*Salix lasiolepis*) with several other species of willow. This community has a well-developed shrub layer supporting species such as Pacific ninebark (*Physocarpus capitatus*), creek dogwood (*Cornus sericea*), and Himalayan blackberry. Giant chain fern (*Woodwardia fimbriata*) also occurs in the understory of this community. These wetlands receive precipitation, tidal flows, subsurface flows, and runoff from the surrounding area (Stantec, 2017). A total of 0.69 acres of willow shrub scrub occurs within the R-519 study area (Stantec, 2017).

4.7.2.3 Perennial Emergent Wetland (Wetland)

Perennial emergent wetlands are a type of emergent wetland that is part of the palustrine wetland classification. Emergent wetlands are divided into two subclasses, persistent and nonpersistent. Perennial emergent wetlands are a persistent emergent wetland because the herbaceous species that dominate them are visible above the soil or water surface year-round. Within the R-519 study area, three vegetation communities are included in the perennial emergent wetland category. These include Baltic rush marshes that occur just outside OHWM of Ryan Slough, along the edges of the channel. This community is dominated by Baltic rush (*Juncus articus* var. *balticus*), and supports gumplant (*Grindelia* sp.), perennial rye grass, and silverweed (*Potentilla anserina*) (Stantec, 2017). Soft rush marshes were also included in the perennial emergent wetland category. These were small areas throughout the wet meadow that occurs north of Myrtle Avenue that are dominated by clumps of soft rush with pasture grasses such as Kentucky bluegrass, perennial rye grass, and tall fescue occurring between the clumps (Stantec, 2017). The third vegetation community included in the perennial emergent wetland category are the low mana grass marshes. These occur in the southern half of the study area, within depressional areas throughout the southern pasture. This community is relatively homogenous, consisting entirely of the non-native waxy manna grass (Stantec, 2017). A total of 2.9 acres of perennial emergent wetlands occur within the R-519 study area (Stantec, 2017).

4.7.2.4 Tidal Waters / Perennial Channel (Waters of the U.S.)

Tidal waters can belong to a variety of wetland classifications including marine, riverine, and estuarine. Determining which classification a site's tidal waters belong to involves identifying the geomorphologic characteristics of the site. A marine system consists of open ocean and is associated with high-energy coastlines. Estuarine systems consist of deepwater tidal habitat and the adjacent tidal wetlands that are influenced by ocean salinity but are diluted from freshwater flow. The riverine system is defined by the presence of wetlands and/or deepwater habitat contained within a channel feature. Within the R-519 study area, the tidal waters present are in

Ryan Slough, classified as a perennial channel (PC-1). Ryan Slough occurs within the study area flowing from south to north with freshwater during times of low tide and north to south with brackish/saltwater during times of high tide. The presence of a bed and bank, an abrupt change in vegetation community, sediment deposition, and the presence of litter and debris were all used to determine the OHWM, per the guidance in the ACOE regulations (33 CFR 328.3). Sources of water for Ryan Slough include surface runoff, tidal flows, subsurface flows, precipitation, and residential irrigation. Ryan Slough is hydrologically connected to Humboldt Bay approximately 1.32 miles to the north (Stantec, 2017). A total of 2.9 acre of tidal waters occur within the R-519 study area (Stantec, 2017).

4.7.3 RT-102 (Line 177A) Maintenance Project

During field survey efforts conducted in December 2018, Padre identified a total of 1.05 acres of Federal jurisdictional waters and wetlands, 2.64 acres of State-defined wetlands, 0.92-acre of waters of the state, and 0.21-acre of stream features within the 2.64-acre study area. Activities within these delineated areas are regulated by the Federal government and/or the State of California. Refer to Appendix E for the Preliminary Federal Aquatic Resources Delineation and State-Defined Wetlands Delineation Report for the RT-102 site.

Ryan Creek, located in the eastern portion of the study area, is a Water of the U.S. under Section 404 of the Clean Water Act and a Section 10 Navigable Waterway subject to Corps jurisdiction. Adjacent lands meeting the three-parameter definition (hydrophytic vegetation, hydric soil, and wetland hydrology) of a federal wetland are also Corps jurisdictional under Section 404 of the Clean Water Act. Lands meeting the one-parameter (hydrophytic vegetation, hydric soil, or wetland hydrology) definition of a State-defined wetland are regulated by the CCC. Ryan Creek and adjacent wetlands also meet the definition of waters of the state defined within the Porter-Cologne Water Quality Control Act to include any surface water or groundwater, including saline waters, within the boundaries of the state and regulated by the NCRWQCB. The bed, bank, floodplain, and riparian corridor of Ryan Creek is also regulated under Section 1600 of the California Fish and Game Code administered by the CDFW.

Within the RT-102 study area there are a variety of wetland types and other waters present. These different wetland types are defined both by their abiotic features such as water regime and topography as well as biotic factors like vegetation communities. The three wetland types found within the study area include forested wetland, scrub-shrub wetland, and wet meadow. Other potential Waters of the U.S. present at the study area include an intermittent/ephemeral channel (Channel 1) and a perennial channel (Ryan Creek). Wetland types were determined by the aforementioned abiotic and biotic factors and the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, 1979). Below is a brief description of each wetland type and of the other waters present in the study area boundary.

4.7.3.1 Forested Wetland (Wetland)

Forested wetlands are a class of palustrine wetland that are defined by the dominance of trees. At least 30 percent of the areal cover must come from tree canopies for a wetland to be classified as forested. To be considered a tree, a woody plant needs to be at least 20 feet tall. Within this class of wetland there are several subclasses that further refine the type of system present. These subclasses are broad-leaved deciduous, needle-leaved deciduous, broad-leaved evergreen, needle-leaved evergreen, and dead. Within the study area, the red alder grove west

of the sinkhole location (mapped as W1) is dominated by broad-leaved deciduous trees that grow up to 80 feet tall (primarily red alder) and is considered broad-leaved deciduous forested wetland. A total of 0.13- acre of forested wetlands occur within the RT-102 study area.

4.7.3.2 Scrub-Shrub Wetland (Wetland)

Scrub-shrub wetlands are a class of palustrine wetland that are defined by a dominance of woody plants that are less than twenty feet tall. An immature forested wetland can be considered a scrub-shrub wetland if the trees in the community have not yet reached a height of 20 feet. As a result, there are a wide variety of plant species that can occur in a scrub-shrub wetland. Within this class of wetland, there are five subclasses that further refine the type of system present. These subclasses are broad -leaved deciduous, needle-leaved deciduous, broad-leaved evergreen, needle-leaved evergreen, and dead. Along the edges of the access route, a mixture of red alder and arroyo willows were present in scrub-shrub wetlands within the redwood forest. In most of these mixed stands, small arroyo willows were the dominant species. The arroyo willow is a broad-leaved deciduous shrub or small tree that is typically less than 30 feet tall. Within the study area, the arroyo willow thickets along the access route (mapped as W3) is a broad-leaved deciduous scrub-shrub wetland. A total of 0.66-acre of scrub-shrub wetland occur within the RT-102 study area.

4.7.3.3 Wet Meadow (Wetland)

Wet meadows are a type of emergent wetland that is part of the palustrine wetland classification. Wet meadows have a dominance of non-woody herbaceous plant species and are typically found in poorly drained areas where water will sometimes pool during high seasonal precipitation. Emergent wetlands are divided into two subclasses, persistent and nonpersistent. Wet meadows are a persistent emergent wetland because the herbaceous species that dominate them are visible above the soil or water surface year-round. Wet meadows often resemble grasslands and they lack standing water for most of the year. Within the study area, two wet meadows were present (mapped as W2 and W4). W2 is located approximately 750 feet northeast of the sinkhole location along the access route. This wetland feature is positioned in a depressional contour that ponds surface water. It was dominated by emergent hydrophytes like slough sedge, soft rush, and coast rush (*Juncus hesperius*). W4 is located approximately 450 feet south of the northern end of the access route. Similar to W2, this wetland feature lies in a depressional area that collects surface water as it drains from the adjacent redwood forest and it supports both slough sedge and small-fruited bulrush. A total of 0.13-acre of wet meadow wetland occurs within the RT-102 study area.

4.7.3.4 Intermittent/Ephemeral Channel (Waters of the U.S.)

Intermittent and ephemeral channels are part of the riverine system classification that is defined by the presence of wetlands and/or deepwater habitats contained within a channel feature. Within the riverine system classification are four subsystems. These are tidal, lower perennial, upper perennial, and intermittent. Intermittent and ephemeral channels only contain flowing water for part of the year and may be completely dry or have isolated pools the remainder of the year. The small channel located west of the sinkhole location (Channel 1) is an intermittent or ephemeral tributary to Ryan Creek. This channel flows through the redwood forest community into a culvert with an outfall to Ryan Creek. The average OHWM of this channel was approximately 16 inches and at the time of surveys in both October and December 2018 had

water approximately 2cm deep flowing through it. Because both survey efforts were conducted within several days of a rain event; therefore, it is unknown whether Channel 1 is intermittent or ephemeral. A total of 0.003-acre of intermittent or ephemeral channel occurs within the RT-102 study area.

4.7.3.5 Perennial Channel (Waters of the U.S.)

Perennial channels are part of the riverine system classification that is defined by the presence of wetlands and/or deepwater habitats contained within a channel feature. Within the riverine system classification are four subsystems. These are tidal, lower perennial, upper perennial, and intermittent. Lower perennial channels are characterized by their low gradient and therefore generally slow-moving water. As the water slows, smaller particulates will precipitate out and create a substrate composed primarily of sand and mud. Under normal circumstances, they have flowing water in them year-round. Upper perennial channels have a high gradient and therefore tend to have faster flowing water. The substrate in these channels is often rock, cobble, gravel, or boulders and upper perennial channels have year-round water flow under normal circumstances. Within the southeastern portion of the study area, Ryan Creek flows north to Ryan Slough, Freshwater Slough, Eureka Slough, and eventually Humboldt Bay. The stretch of Ryan Creek that flows through the study area has a low gradient and a substrate made of relatively fine particulates. It is also located above the upstream extent of tidal influence (generally the upstream limits of tidal influence Ryan Slough is approximately the Myrtle Avenue bridge). Within the study area, Ryan Creek is classified as a lower perennial channel. A total of 0.13-acre of perennial channel occurs within the RT-102 study area.

The PG&E Pipeline Maintenance Project is expected to impact federal and state jurisdictional aquatic resources. Figures 3-1 through 3-3 depict project impacts to federal jurisdictional aquatic resources and Figures 4-1 through 4-3 depict project impacts to state jurisdictional aquatic resources.

4.8 WILDLIFE

Wildlife observed at the project sites were characteristic of the region and of the coastal riparian, pastureland, and forested habitats. A comprehensive list of wildlife species observed during the surveys are included in Appendix D. Special-status wildlife species (i.e., endangered, threatened, rare, or other sensitive species) occurring, or potentially occurring, within the project site and surrounding area are discussed in Section 4.9 below.

The vegetation communities on the sites and surrounding area provide habitat for resident and migratory wildlife species. The composition, density, distribution, and physical characteristics of vegetative communities determine the diversity and abundance of wildlife species residing in the project areas. Wildlife species observed and expected within the vegetative cover types present on the sites are discussed below.

The open pastureland and coastal influence found at R-354 and R-519 provide forage and cover for small mammals, such as California vole (*Microtus californicus*) and small amphibians like the Pacific tree frog (*Pseudacris sierra*). These species, in turn, provide the prey base that attracts predators such as red-tailed hawk (*Buteo jamaicensis*), northern harrier (*Circus cyaneus*), and great egret (*Ardea alba*). Potential nesting habitat at these sites is limited to sparse riparian tree cover and the pastureland used for cattle grazing. At the RT-102 project site, dense tree

cover along a riparian corridor provides habitat for a different suite of wildlife species. Here, northern red-legged frogs (*Rana aurora*), vagrant shrews (*Sorex vagrans*), California voles, and brush rabbits (*Sylvilagus bachmani*), provide the prey base for predators like raptors, coyote (*Canis latrans*), and black bear (*Ursus americanus*). In these forested areas, there is a variety of nesting habitats for migratory bird species in the tree understories and canopies.

Bird species observed at the project sites include great egret, great blue heron (*Ardea herodias*), northern harrier, red-tailed hawk, mountain quail (*Oreotyx pictus*), Townsend's warbler (*Setophaga townsendi*), ruby-crowned kinglet (*Regulus calendula*), common raven (*Corvus corax*), chestnut-backed chickadee (*Poecile rufescens*), hairy woodpecker (*Dryobates villosus*), and American robin (*Turdus migratorius*), all species that are consistent with both year-round residents and migrants in the area. See Appendix D for wildlife species observed at the project sites.

Terrestrial special-status wildlife species observed at the project sites include white-tailed kite (*Elanus leucurus*) and yellow warbler (*Setophaga petechia*) observed at the R-354 project site, yellow warbler, Vaux's swift (*Chaetura vauxi*), black-capped chickadee (*Poecile atricapillus*), and northern red-legged frog (*Rana aurora*) observed at the RT-102 site. No terrestrial special-status wildlife species were observed during surveys at the R-519 project site.

General surveys for bats or bat sign were conducted at the bridges adjacent to the R-354 and R-519 sites. The bridges do not offer day roosting habitat for bat species. The bridge adjacent to R-354 contains large pass through crevices that allows a significant amount of light through to the underside of the bridge that makes the bridge unsuitable for day roosting. The bridge adjacent to the R-519 project site does not contain any crevices to provide habitat for roosting bat species. No sign of bats was detected at either location. In addition, no signs of swallow nests were observed under the bridges.

4.9 SPECIAL-STATUS SPECIES

For the purposes of this Report, a special-status species is a plant or animal species that is:

- Listed endangered, threatened, or a candidate species under the federal Endangered Species Act (FESA);
- Listed endangered, threatened, or a candidate species under the California Endangered Species Act (CESA);
- Listed as a Species of Special Concern by the California Department of Fish and Wildlife (CDFW);
- A plant species that is on the California Native Plant Society's (CNPS) Rare Plant Ranking System as List 1 or 2; and/or
- Considered rare, threatened, or endangered under CEQA Guidelines 15380(d) as the species survival is in jeopardy due to loss or change in habitat.

In addition, species protected by specific federal or state regulation or local ordinances are considered special-status species.

Based on the literature review and species lists from USFWS (Consultation Codes: 08EACT00-2019-SLI-0385 [RT-102]; 08EACT00-2019-SLI-0386 [R-519]; and 08EACT00-2019-SLI-0387 [R-354]), a list of special-status species that have been reported within five mile radius

surrounding the project sites, or within Humboldt County, has been compiled. Special-status species that have the potential to occur in the vicinity of the project site are listed in Table 3. Table 3 also includes rationale for why certain species were excluded from further analysis in this document. Special-status species occurring within five miles of the PG&E Pipeline Maintenance Project sites are depicted in Figure 5.

An analysis of the likelihood of occurrence for each species was conducted on the basis of species ranges, previous observations, contemporary sightings, and presence of suitable habitat elements. The PG&E pipeline maintenance projects may be located outside of the known range of some species, or within the geographic range for a certain species, but suitable habitat, such as coastal dune, cismontane woodland, or old growth forest is absent onsite. For the purpose of this analysis, potential special-status species that occur in the general area of the project, and for which the project may provide habitat, are discussed in greater detail in Sections 4.9.1 and 4.9.2 below.

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
PLANTS						
<i>Abronia umbellata</i> <i>var. breviflora</i>	Pink sand-verbena	CRPR 1B.1	Coastal dunes along California, Oregon, and Washington. Found at elevations ranging from 0 to 30 feet. Blooms from June to October.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.
<i>Angelica lucida</i>	Sea-watch	CRPR 4.2	Coastal bluff scrub, coastal dunes, coastal scrub, and coastal salt marshes and swamps at elevations ranging from 0 to 490 feet. Blooms from May to September.	Moderate / Potentially suitable habitat present along the established banks of Freshwater Slough. An occurrence was identified approximately 0.6 miles to the south during rare plant surveys conducted in May and July 2017. Several individuals of this plant were recorded during 2019 rare plant surveys occurring both north and south of Freshwater Slough.	High / Species identified during rare plant surveys conducted in May and July 2017 along Ryan Slough for this Project (Stillwater Sciences, 2018a).	Low / Poor habitat is present along Ryan Creek. Project site is located 4.5 miles from the coast and is mostly outside of tidal and coastal water influence.

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
				(Stillwater Sciences, 2019).		
<i>Astragalus pycnostachyus</i> <i>var. pycnostachyus</i>	Coastal marsh milk-vetch	CRPR 1B.2	Mesic coastal dunes, coastal scrub, and coastal salt marshes and swamps at elevations ranging from 0 to 100 feet. Typically blooms from June to October but can bloom as early as April.	None / Occurrences in Humboldt County are located immediately on the coast. Inland tidal marsh habitat on site is not suitable.	None / Occurrences in Humboldt County are located immediately on the coast. Inland brackish marsh habitat on site is not suitable.	None / Occurrences in Humboldt County are located on the immediately on the coast. Inland freshwater marsh habitat on site is not suitable.
<i>Bryoria spiralifera</i>	Twisted horsehair lichen	CRPR 1B.1	Epiphytic plant that typically grows on conifers in North Coast coniferous forests located immediately adjacent to the coast. Found at elevations ranging from 0 to 100 feet.	None / Occurrences in California are all located within two miles of the Coast. Project site is located approximately 4 miles from the coast.	None / Occurrences in California are all located within two miles of the Coast. Project site is located over 4 miles from the coast.	None / Occurrences in California are all located within two miles of the Coast. Project site is located more than 4.5 miles from the coast.
<i>Cardamine angulata</i>	Seaside bittercress	CRPR 2B.1	Wet areas and stream banks in North Coast	Low / Poor habitat is present along Freshwater Slough.	Moderate / Marginally suitable habitat is present in	Moderate / Suitable habitat is present along Channel 1 and

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
			coniferous forests and lower montane coniferous forests at elevations ranging from 80 to 3,000 feet. Typically blooms from March to July but can bloom as early as January.	Nearest occurrence (Occ. # 2) is approximately 2.9 miles to the southeast. Rare plant surveys conducted in 2019 did not detect this species (Stillwater Sciences, 2019).	shaded areas along Ryan Slough. Nearest occurrence (Occ. #2) is approximately 2.5 miles to the southeast. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018a).	Ryan Creek in forested portions of the project site. Nearest occurrence (Occ. #2) is approximately 2.4 miles to the southeast. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018a).
<i>Carex arcta</i>	Northern clustered sedge	CRPR 2B.2	Bogs, fens, and mesic North Coast coniferous forests at elevations ranging from 190 to 4,600 feet. Blooms from June to September.	Low / Marginally suitable habitat present in the wet meadows on site. Nearest occurrence (Occ #6) is approximately 1.3 miles to the west. Rare plant surveys conducted in 2019 did not detect this species (Stillwater Sciences, 2019).	Low / Marginally suitable habitat present in the wet meadows on site. Nearest occurrence (Occ. #6) is approximately 1.5 miles to the northwest. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018a).	Moderate / Suitable habitat is present in more permanently ponded areas of the access road and the forested wetland adjacent to the sink hole locations. Nearest occurrence (Occ. #6) is approximately 1.7 miles to the northwest. Rare plant surveys conducted for this project in 2017 did not detect this species

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
						(Stillwater Sciences, 2018b).
<i>Carex lyngbyei</i>	Lyngbye's sedge	CRPR 2B.2	Brackish or freshwater marshes and swamps at elevations ranging from 0 to 30 feet. Blooms from April to August.	High / Suitable habitat present along the banks of Freshwater Slough. A few sparse patches of this plant were recorded during 2019 rare plant surveys occurring in the salt marsh habitat south of Freshwater Slough (Stillwater Sciences, 2019).	High / Suitable habitat present along the banks of Ryan Slough. Was observed during rare plant surveys conducted for this Project in May and July 2017 (Stillwater Sciences, 2018a).	High / Suitable habitat present along the banks of Ryan Creek. Was observed during rare plant surveys conducted for this Project in May and July 2017 (Stillwater Sciences, 2018b).
<i>Carex praticola</i>	Northern meadow sedge	CRPR 2B.2	Mesic meadows and seeps at elevations ranging from 0 to 10, 500 feet. Blooms from May to July.	Moderate / Suitable habitat present in the wet meadows located on the site. Nearest occurrence (Occ. #6) is from 1915 and is located approximately 700 feet to the south. Rare plant surveys conducted in 2019 did not detect this	Moderate / Suitable habitat is present in the wet meadows located onsite. Nearest occurrence (Occ. #6) is from 1915 and is located within the Project area. Rare plant surveys conducted for this project in 2017 did not detect this species	Moderate / Suitable habitat is present in the mesic wetland areas located along the access road. Nearest occurrence (Occ. #6) is from 1915 and is located within the Project area. Rare plant surveys conducted for this project in 2017 did not detect this species

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
				species (Stillwater Sciences, 2019).	(Stillwater Sciences, 2018a).	(Stillwater Sciences, 2018b).
<i>Castilleja ambigua</i> var. <i>humboldtiensis</i>	Humboldt Bay owl's-clover	CRPR 1B.2	Coastal salt marshes and swamps at elevations ranging from 0 to 10 feet.	High / Suitable habitat is present along the banks of Freshwater Slough. Plant was identified on the south side of the project site in 2004 (Occ # 33). A population of approx. 350 individuals was recorded during 2019 rare plant surveys occurring in the salt marsh habitat south of Freshwater Slough (Stillwater Sciences, 2019).	High / Plant was identified along portions of Ryan Slough during rare plant surveys conducted for this Project in May and July 2017 (Stillwater Sciences, 2018a)	Low / Poor quality habitat is located along Ryan Creek. site is not influenced by tide. Nearest occurrence (Occ # 29) is approximately 0.6 miles north of the project site. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018b).
<i>Castilleja litoralis</i>	Oregon coast paintbrush	CRPR 2B.2	Sandy coastal scrub, coastal bluff scrub, and coastal dunes at elevations ranging from 50 to 330 feet. Blooms from June to July.	None / There is no suitable habitat located at the project site. Rare plant surveys conducted in 2019 did not detect this species (Stillwater Sciences, 2019).	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
<i>Chloropyron maritimum</i> ssp. <i>palustre</i>	Point Reyes salty bird's beak	CRPR 1B.2	Coastal salt marshes and swamps at elevations ranging from 0 to 30 feet. Blooms from June to October.	Low / Marginally suitable habitat is present along Freshwater Slough. Nearest occurrence (Occ. #27) is approximately 0.7 miles to the north. Rare plant surveys conducted in 2019 did not detect this species (Stillwater Sciences, 2019).	None / No suitable habitat is present at the project site.	None / No suitable habitat is present at the project site.
<i>Collinsia corymbosa</i>	Round-headed Chinese-houses	CRPR 1B.2	Coastal dunes at elevations ranging from 0 to 65 feet. Blooms from April to June.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.
<i>Erysimum menziesii</i>	Menzies' wallflower	FE, SE, CRPR 1B.1	Coastal dunes at elevations ranging from 0 to 115 feet. Blooms from March to September.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.
<i>Erythronium revolutum</i>	Coast fawn lily	CRPR 2B.2	Mesic streambanks in North Coast coniferous forests, broadleaf upland	Low / Poor habitat is present along Freshwater Slough. The nearest	Low / Marginally suitable habitat is present in shaded areas along Ryan	Moderate / Suitable habitat is present along Channel 1 and Ryan Creek in forested

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
			forests, and bogs and fens at elevations ranging from 0 to 5,250 feet. Typically blooms from March to July but can bloom later into August.	occurrence (Occ. #13) is from 1918 and is approximately 1.3 miles west of the site. Rare plant surveys conducted in 2019 did not detect this species (Stillwater Sciences, 2019).	Slough. The nearest occurrence (Occ. #13) is from 1918 and is approximately 1.5 miles northwest of the site. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018a).	portions of the project site. The nearest occurrence (Occ. #13) is from 1918 and is approximately 1.7 miles west of the site. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018b).
<i>Fissidens pauperculus</i>	Minute pocket moss	CRPR 1B.2, FSS	Bare moist soil banks in North Coast coniferous forests at elevations ranging from 30 to 3,360 feet.	None / There is no suitable habitat located at the project site.	Low / Poor habitat is present on the western side of Ryan Slough beneath the cover of the coniferous trees. The nearest occurrence (Occ. #18) is approximately 2 miles to the southeast. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018a).	Moderate / Suitable habitat is present in the redwood forests located adjacent to the project site. The nearest occurrence (Occ. #18) is approximately 1.8 miles to the southeast. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018b).

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
<i>Gilia capitata</i> ssp. <i>pacifica</i>	Pacific gilia	CRPR 1B.2	Valley and foothill grasslands, openings in chaparral, coastal prairies, and coastal bluff scrub at elevations ranging from 15 to 5,460 feet. Blooms from April to August.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	Low / Poor habitat is present along the access road. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018b).
<i>Gilia millefoliata</i>	Dark-eyed gilia	CRPR 1B.2	Coastal dunes at elevations ranging from 6 to 100 feet. Blooms from April to July.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.
<i>Hesperervax sparsiflora</i> var. <i>brevifolia</i>	Short-leaved evax	CRPR 1B.2	Sandy coastal bluff scrub, coastal prairies, and coastal dunes at elevations ranging from 0 to 700 feet. Blooms from March to June.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.
<i>Lasthenia californica</i> ssp. <i>macrantha</i>	Perennial goldfields	CRPR 1B.2	Coastal bluff scrub, coastal scrub, and coastal dunes at elevations ranging from 15 to 1,700	Low / Most occurrences in California are located immediately adjacent to the coast. Occ.	Low / Most occurrences in California are located immediately adjacent to the coast. Occ.	None / There is no suitable habitat located at the project site.

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
			feet. Blooms from January to November.	#61 near Crescent City is the furthest inland at approximately 4.8 miles from the coast. Marginally suitable habitat is present along the levee of Freshwater Slough. Rare plant surveys conducted in 2019 did not detect this species (Stillwater Sciences, 2019).	#61 near Crescent City is the furthest inland at approximately 4.8 miles from the coast. Marginally suitable habitat is present along the levee of Ryan Slough. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018a).	
<i>Lathyrus japonicus</i>	Seaside pea	CRPR 2B.1	Coastal dunes at elevations ranging from 0 to 100 feet. Blooms from May to August.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.
<i>Lathyrus palustris</i>	Marsh pea	CRPR 2B.2	Mesic habitats in bogs and fens, coastal prairies, coastal scrub, lower montane coniferous forests, marshes and swamps, and North Coast	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	Moderate / Marginal habitat is present in the mesic portions of the project site. Nearest occurrence (Occ. #2) is located approximately 3.3 miles southwest. Rare

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
			Coniferous forests at elevations ranging from 0 to 330 feet. Blooms from March to August.			plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018b).
<i>Layia carnosa</i>	Beach layia	FE, SE, CRPR 1B.1	Coastal dunes and sandy coastal scrub at elevations ranging from 0 to 200 feet. Blooms from March to July.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.
<i>Lilium occidentale</i>	Western lily	FE, SE, CRPR 1B.1	Openings in North Coast coniferous forests, freshwater marshes and swamps, bogs and fens, coastal bluff scrub, coastal prairies, and coastal scrub at elevations ranging from 0 to 606 feet. Blooms from June to July.	Low / Poor habitat is present on the project site. Occurrences in the area are from 1925 and are presumed extirpated. Rare plant surveys conducted in 2019 did not detect this species (Stillwater Sciences, 2019).	Low / Potentially suitable habitat is present at the project site. Occurrences in the area are from 1925 and are presumed extirpated. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018a).	Low / Potentially suitable habitat is present along the access road. Occurrences mapped in the area are from 1925 and are presumed extirpated. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018b).

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
<i>Lycopodium clavatum</i>	Running pine	CRPR 4.1	Edges, openings, or roadsides in mesic lower montane coniferous forests, marshes and swamps, and mesic North Coast coniferous forests at elevations ranging from 150 to 4,020 feet. Typically blooms from June to August but can bloom into September.	None / There is no suitable habitat located at the project site.	Low / Poor quality habitat is present west of Ryan Slough on the project site. Nearest occurrence (Occ. #76) is approximately 3 miles to the east. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018a).	Moderate / Suitable habitat is present along the access road. Nearest occurrence (Occ. #76) is approximately 3 miles to the east. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018b).
<i>Monotropa uniflora</i>	Ghost-pipe	CRPR 2B.2	Broadleaved upland forests and North Coast coniferous forests at elevations ranging from 30 to 1,800 feet. Typically blooms from June to August but can bloom into September.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	Moderate / Potentially suitable habitat is present in the willow and red alder patches along the access road. The nearest occurrence (Occ. #1) was last seen in 1971 and was observed within the Project area. Rare plant surveys conducted for this project in 2017 did not detect this species

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
						(Stillwater Sciences, 2018b).
<i>Montia howellii</i>	Howell's montia	CRPR 2B.2	Vernally mesic meadows and seeps, vernal pools, and North Coast coniferous forests at elevations ranging from 0 to 2,740 feet. Typically blooms from March to May but can bloom earlier in January and February.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	Moderate / Potentially suitable vernal seeps may be present in sections of the redwood forest adjacent to the project site. Nearest recent occurrence (Occ. #14) is from 2014 and is approximately 1.5 miles south. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018b).
<i>Oenothera wolfii</i>	Wolf's evening-primrose	CRPR 1B.1	Sandy and mesic lower montane coniferous forests, coastal bluff scrub, coastal prairies, and coastal dunes at elevations ranging from 10 to 2,620 feet. Blooms from May to October.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
<i>Sidalcea malachroides</i>	Maple-leaved checkerbloom	CRPR 4.2	Often disturbed areas in broadleaved upland forests, coastal scrub, coastal prairies, riparian woodlands, and North Coast coniferous forests at elevations ranging from 0 to 2400 feet. Typically blooms from April to August but can start blooming in March.	Low / Poor habitat is present at the project site. The nearest recent occurrence (Occ. #84) is approximately 1.8 miles southeast.	Low / Poor habitat is present at the project site. The nearest occurrence (Occ. #84) is approximately 1.2 miles southeast.	Moderate / Suitable habitat is present along the access road. The nearest occurrence (Occ. #84) is approximately 0.8 miles southeast. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018b).
<i>Sidalcea malviflora</i> ssp. <i>patula</i>	Siskiyou checkerbloom	CRPR 1B.2	Often roadcuts in North Coast coniferous forests, coastal bluff scrub, and coastal prairies at elevations ranging from 50 to 2630 feet. Typically blooms from May to August but can start blooming as early as April.	None / Poor habitat is present onsite and the nearest occurrence (Occ. #4) is approximately 2.4 miles west and has not been observed since 1944.	None / Poor habitat is present onsite and the nearest occurrence (Occ. #4) is approximately 2.1 miles west and has not been observed since 1944.	Moderate / Potentially suitable habitat is present along the access road. Nearest occurrence (Occ. #4) is approximately 2 miles west. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018b).

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
<i>Sidalcea oregana</i> <i>ssp. eximia</i>	Coast checkerbloom	CRPR 1B.2	Lower montane coniferous forests, meadows and seeps, and North Coast coniferous forests at elevations ranging from 15 to 4,400 feet. Blooms from June to August.	Low / Poor quality habitat present in the wet meadow on site. Nearest occurrence (Occ. #4) is 4.1 miles away and was last observed in 1907. Rare plant surveys conducted in 2019 did not detect this species (Stillwater Sciences, 2019).	Low / Poor quality habitat present in the wet meadow on site. Nearest occurrence (Occ. #4) is 3.6 miles away and was last observed in 1907. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018a).	Moderate / Potentially suitable habitat present in wet meadows on the access road. Nearest occurrence (Occ. #4) is 3.3 miles away and was last observed in 1907. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018b).
<i>Silene scouleri</i> ssp. <i>scouleri</i>	Scouler's catchfly	CRPR 2B.2	Coastal bluff scrub, coastal prairies, and valley and foothill grasslands at elevations ranging from 0 to 1,970 feet. Typically blooms from June to August but can start blooming as early as March and May and continue in September.	Low / Poor quality habitat present in the wet meadow on site. Nearest occurrence (Occ. #19) is 2.4 miles away and was last observed in 1904. Rare plant surveys conducted in 2019 did not detect this species (Stillwater Sciences, 2019).	Low / Poor quality habitat present in the wet meadow on site. Nearest occurrence (Occ. #19) is 2.1 miles away and was last observed in 1904. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018a).	Low / Poor quality habitat present in the wet meadow on site. Nearest occurrence (Occ. #19) is 2 miles away and was last observed in 1904. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018b).

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
<i>Spergularia canadensis</i> var. <i>occidentalis</i>	Western sand-spurrey	CRPR 2B.1	Coastal salt marshes and swamps at elevations ranging from 0 to 10 feet. Blooms from June to August.	High / Suitable habitat present in the tidal marsh habitat. Species was observed (Occ. #4) in a survey conducted in the Project area in 2004. Approximately 200 individuals were recorded during 2019 rare plant surveys occurring in two locations in the salt marsh habitat south of Freshwater Slough (Stillwater Sciences, 2019). One of these occurrences was a known CNDDDB occurrence.	Moderate / Potentially suitable habitat is present along Ryan Slough. Species was not observed during rare plant surveys conducted in 2017 (Stillwater Sciences, 2018a).	Low / Poor quality habitat is present along Ryan Creek. Species was not observed during rare plant surveys conducted in 2017 (Stillwater Sciences, 2018b).
<i>Viola palustris</i>	Alpine marsh violet	CRPR 2B.2	Coastal bogs and fens and mesic coastal scrub at elevations ranging from 0 to 490 feet. Blooms from March to August.	None / There is no suitable habitat at the project site. The two nearest occurrences (Occ. #3 and #6) were both last observed in 1923.	Low / Marginally suitable habitat is present in low lying marsh to the northwest of the site. The two nearest occurrences (Occ. #3 and #6) were both last observed in	Low / Potential poor quality habitat is present in the margins of low lying ponded areas of the project site. The two nearest occurrences (Occ. #3 and #6) were both last observed in 1923.

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
					1923. Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018a).	Rare plant surveys conducted for this project in 2017 did not detect this species (Stillwater Sciences, 2018b).
INVERTEBRATES						
<i>Anodonta californiensis</i>	California floater	FSS	Freshwater mussel that inhabits both lakes and low gradient streams at low elevations.	Moderate / Potentially suitable habitat is present in Freshwater Slough. Species is known to occur in the Elk River drainage approximately 4.6 miles to the southwest (Occ. #4).	Moderate / Potentially suitable habitat is present in Ryan Slough. Species is known to occur in the Elk River drainage approximately 4.1 miles to the southwest (Occ. #4).	Moderate / Potentially suitable habitat is present in Ryan Creek. Species is known to occur in the Elk River drainage approximately 3.9 miles to the southwest (Occ. #4).
<i>Bombus occidentalis</i>	Western bumble bee	SC, FSS	Variety of terrestrial habitats including grasslands and shrublands.	Moderate / Potentially suitable habitat present at the project site. The nearest occurrence (Occ. #41) is approximately 1.3 miles west.	Moderate / Potentially suitable habitat present at the project site. The nearest occurrence (Occ. #41) is approximately 1.5 miles northwest.	Moderate / Potentially suitable habitat present at the project site. The nearest occurrence (Occ. #41) is approximately 1.7 miles northwest.

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
FISHES						
<i>Acipenser medirostris</i>	Green sturgeon – Southern DPS	FT, CSC	Found in near shore marine and estuarine environments from Alaska to Baja California, Mexico. Southern DPS typically occurs south of the Eel River but has been documented in Humboldt Bay. Additional habitat and life history information provided in Section 4.9.2.	Low / Species is known to seasonally reside in Humboldt Bay and may forage in Freshwater Slough. Nearest occurrence (Occ. #1) is a specimen that was found in Humboldt Bay in 2007.	Low / Species is known to seasonally reside in Humboldt Bay and may forage in Freshwater Slough. Nearest occurrence (Occ. #1) is a specimen that was found in Humboldt Bay in 2007.	Low / Species is known to seasonally reside in Humboldt Bay and may forage in Ryan Creek. Nearest occurrence (Occ. #1) is a specimen that was found in Humboldt Bay in 2007.
<i>Entosphenus tridentatus</i>	Pacific lamprey	CSC, FSS	Anadromous species although some permanent freshwater populations exist. Found in streams that enter the Pacific Ocean. Larvae and adults found in silt, mud, or sand banks along streams and	High / Species has been documented in Freshwater Slough and its tributaries which flow into Humboldt Bay. The nearest occurrence (Occ. #4) includes the portion of Freshwater Slough	High / Species has been documented in Freshwater Slough and its tributaries which flow into Humboldt Bay. The nearest occurrence (Occ. #4) includes the portion of Ryan Slough that runs	High / Species has been documented in Freshwater Slough and its tributaries which flow into Humboldt Bay. The nearest occurrence (Occ. #4) includes the portion of Ryan Creek

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
			spawning adults are more common in rocky riffles. Additional habitat and life history information provided in Section 4.9.2.	that runs through to the project site.	through to the project site.	that runs adjacent to the project site.
<i>Eucyclogobius newberryi</i>	Tidewater goby	FE, CSC	Brackish water along the coast preferring streams that create depositional berms protecting the outlet from higher levels of salinity. Additional habitat and life history information provided in Section 4.9.2.	Moderate / Nearest occurrence (Occ. #124) is a historic occurrence located immediately adjacent to the project site (Park Street Marsh) though species has not been detected in recent surveys. Suitable habitat is present. Site does not provide potential spawning habitat within slough and in-water work areas.	Moderate / Nearest occurrence (Occ. #120) is located approximately 1.1 miles from the project site, within tidewater goby dispersal distance, and habitat conditions at the site are suitable for the species. Site does not provide potential spawning habitat within slough and in-water work areas.	Low / Species was not found in Ryan Slough During CDFW stock assessment (Wallace, 2014a). Nearest occurrence (Occ. #120) is located approximately 2.5 miles from the project site, within tidewater goby dispersal distance, and habitat/water quality would not exclude the presence of the species (Normandeau Associates, 2015). Site does not provide potential spawning habitat.

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
<i>Oncorhynchus clarkii clarkii</i>	Coast cutthroat trout	CSC, FSS	Live in low gradient coastal streams and estuaries. Typically, an anadromous fish spending the summers in the Pacific Ocean near the coast and migrating upstream in September to October, sometimes as far as 55 miles upstream. Spawns in streams with small gravel substrates. Additional habitat and life history information provided in Section 4.9.2.	High / Species is considered to be present in all perennial channels that flow into Humboldt and Arcata Bay. The nearest occurrence (Occ. #15) includes the portion of Freshwater Slough that runs through the project site. High water temperatures in late summer months results in a seasonal low likelihood of occurrence	High / Species is considered to be present in all perennial channels that flow into Humboldt and Arcata Bay. The nearest occurrence (Occ. #15) includes the portion of Ryan Slough that Runs through the project site. High water temperatures in late summer months results in a seasonal low likelihood of occurrence	High / Species is considered to be present in all perennial channels that flow into Humboldt and Arcata Bay. The nearest occurrence (Occ. #15) includes the portion of Ryan Creek that runs adjacent to the project site. Least likely to occur during the low flow season (July 1 – Oct 15) which is when construction would occur.
<i>Oncorhynchus kisutch</i> pop. 2	Coho salmon – southern Oregon / northern California ESU	FT, ST	Inhabits cool freshwater streams with pools and riffles between Cape Blanco, Oregon and Punta Gorda, California. Additional habitat and life history information	High / Spawning adults and smolts have been observed in the Freshwater and Ryan Slough System. The nearest occurrence (Occ. #8) includes this site. High water temperatures in late	High / Spawning adults and smolts have been observed in the Freshwater and Ryan Slough System. The nearest occurrence (Occ. #8) includes this site. High water temperatures in late	High / Spawning adults and smolts have been observed in the Freshwater and Ryan Slough System. The nearest occurrence (Occ. #8) includes Least likely to occur during the low flow season (July 1 – Oct

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
			provided in Section 4.9.2.	summer months result in a seasonal low likelihood of occurrence in lower portions of the watershed.	summer months result in a seasonal low likelihood of occurrence in lower portions of the watershed.	15) which is when construction would occur
<i>Oncorhynchus mykiss irideus</i> pop. 16	Steelhead – northern California DPS	FT	Spawns from late December through April in cool, clear, well oxygenated streams with dense vegetation on the banks and cover in the water. Resides in coastal basins from Redwood Creek to the Gualala River. Additional habitat and life history information provided in Section 4.9.2.	High / Species in has been documented in Freshwater Slough and its tributaries that flow into Humboldt Bay. The nearest occurrence (Occ. #8) includes the portion of Freshwater Slough that runs through to project site. High water temperatures in late summer months result in a seasonal low likelihood of occurrence in lower portions of the watershed.	High / Species in has been documented in Freshwater Slough and its tributaries that flow into Humboldt Bay. The nearest occurrence (Occ. #8) includes the portion of Ryan Slough that runs through to project site. High water temperatures in late summer months result in a seasonal low likelihood of occurrence in lower portions of the watershed.	High / Species in has been documented in Freshwater Slough and its tributaries that flow into Humboldt Bay. The nearest occurrence (Occ. #8) includes the portion of Ryan Creek that runs through to project site. Least likely to occur during the low flow season (July 1 – Oct 15) which is when construction would occur
<i>Oncorhynchus tshawytscha</i> pop. 17	Chinook salmon – California coastal ESU	FT	Spawn in large streams and rivers in the spring and fall	High / Species has been documented within the Freshwater	High / Species has been documented within the Freshwater	Moderate / Species has been documented within the Freshwater

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
			between Redwood Creek and the Russian River. Additional habitat and life history information provided in Section 4.9.2.	Slough System. Individuals have been collected at a permanent weir site located approximately 3.1 miles upstream of the mouth of Freshwater Slough. High water temperatures in late summer months result in a seasonal low likelihood of occurrence in lower portions of the watershed.	Slough System. Individuals have been collected at a permanent weir site located approximately 3.1 miles upstream of the mouth of Freshwater Slough. High water temperatures in late summer months result in a seasonal low likelihood of occurrence in lower portions of the watershed.	Slough System. Individuals have been collected at a permanent weir site located approximately 3.1 miles upstream of the mouth of Freshwater Slough. Species was rarely caught in the rotary screw trap operated by Green Diamond Resource Company located in Lower Ryan Creek. Least likely to occur during the low flow season (July 1 – Oct 15) which is when construction would occur
<i>Spirinchus thaleichthys</i>	Longfin smelt	CT, CSC	Occupies a variety of coastal waters including estuaries, bays, and rivers. During breeding, this species spawns in freshwater tributaries near the ocean. Additional	High / Species has been documented in the Arcata Bay and in Freshwater Slough (Occ. #1). CDFW surveys captured longfin smelt in upper Freshwater Slough and upstream of	High / Species has been documented in Freshwater Slough (Occ. #1). In the Eel River to the south, individuals were collected 4.5 miles upstream. The project site is	Moderate / Species has been documented in Freshwater Slough (Occ. #1). In the Eel River to the south, individuals were collected 4.5 miles upstream. The project site is approximately

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
			habitat and life history information provided in Section 4.9.2.	Ryan Slough Confluence (Wallace, 2014a) (Garwood, 2017).	approximately 3.7 upstream from the mouth of Freshwater Slough. CDFW surveys captured longfin smelt in upper Freshwater Slough and upstream of Ryan Slough Confluence (Wallace, 2014a) (Garwood, 2017).	4.5 miles upstream from the mouth of Freshwater Slough. CDFW surveys captured longfin smelt in upper Freshwater Slough and upstream of Ryan Slough Confluence (Wallace, 2014a). Potential for occurrence seasonally in Ryan Slough and Ryan Creek (Normandeau Associates, 2015).
<i>Thaleichthys pacificus</i>	Eulachon	FT	Anadromous fish that spends the majority of their lives in the Pacific Ocean but spawns in freshwater habitats. Prefers spawning in freshwater habitats with silt, sand, gravel, or cobble substrates, rarely more than a few miles inland.	Low / Species requires a narrow temperature range to spawn (about 4-8°C) which is not met at the project site. Nearest occurrence (Occ. #8) is a historic occurrence from 1977 near Jacoby Creek and the species is unlikely to occur in Arcata Bay.	Low / Species requires a narrow temperature range to spawn (about 4-8°C) which is not met at the project site. Nearest occurrence (Occ. #8) is a historic occurrence from 1977 near Jacoby Creek and the species is unlikely to occur in Arcata Bay.	Low / Species requires a narrow temperature range to spawn (about 4-8°C) which is not met at the project site. Nearest occurrence (Occ. #8) is a historic occurrence from 1977 near Jacoby Creek and the species is unlikely to occur in Arcata Bay.

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
AMPHIBIANS						
<i>Ascaphus truei</i>	Pacific tailed frog	CSC	Rocky, cool, clear, permanent streams in wet forests. Not typically found in lakes or ponds.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	Low / Ryan Creek provides poor habitat due to its high sedimentation. Channel 1 provides marginal habitat due to its clear cool water but lack of rocky substrate and small size. Nearest occurrence (Occ# 204) is approximately 4.1 miles southeast.
<i>Rana aurora</i>	Northern red-legged frog	CSC, FSS	Forests and grasslands near streambeds with plant cover, typically in lowlands or foothills. Breeds in permanent slow moving water sources like lakes, ponds, marshes, swamps, and slow streams.	Low / Marginal habitat present in slow moving reaches of Freshwater Slough adjacent to the southern side of the project site. Nearest occurrence (Occ. #192) is approximately 0.7 miles northeast.	High / Suitable habitat present in present in low lying marsh to the northwest of the site. Nearest occurrence (Occ. #196) is approximately 1.1 miles to the east.	High / Suitable habitat is present along Ryan Creek and its tributaries. An individual was observed during surveys conducted in October 2018 in Channel 1, the unnamed tributary to Ryan Creek.

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
<i>Rana boylei</i>	Foothill yellow-legged frog	SC, CSC, FSS	Rocky streams and rivers with sunny banks in woodlands, forests, and chaparral. Typically, higher grade perennial streams with pools and riffles although can be found in isolated pools or ponds or seasonal creeks.	None / Freshwater Slough provides poor habitat due to its turbid and brackish water, its low gradient, and silty and muddy substrate.	None / Ryan Slough provides poor habitat due to its low gradient, turbid water, and silty muddy substrate. Nearest occurrence (Occ. #1069) is approximately 3.9 miles northeast.	Low / Ryan Creek provides poor habitat. Channel 1 provides marginal habitat. Nearest occurrence (Occ. #1069) is approximately 4.3 miles northeast.
<i>Rhyacotriton variegatus</i>	Southern torrent salamander	CSC, FSS	Cold, shaded, and clear streams and seepages, typically in old growth forests. Larvae found in shallow still water in creeks.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	Low / Potentially suitable habitat is present in Channel 1. Nearest occurrence (Occ. #280) is approximately 3.8 miles northwest.
REPTILES						
<i>Emys marmorata</i>	Western pond turtle	CSC	Ponds, marshes, rivers, streams and irrigation ditches with aquatic vegetation. Needs basking sites and suitable upland	Low / Suitable habitat is present along Freshwater Slough. This species has been observed in Freshwater Slough approximately 2.9	Moderate / Suitable habitat present along Ryan Slough. Areas of low flow provide refuge and banks provide basking sites. Nearest	Moderate / Suitable habitat present along Ryan Creek. Nearest occurrence (Occ. #1364) is

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Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
			habitat (sandy banks, grassy open fields) for egg laying	miles east of the site (Occ. #1238). However, lack of basking habitat limits potential for occurrence in Project area. WPT is not expected to occur on Project site.	occurrence (Occ. #1364) is approximately 3.4 miles southwest.	approximately 2.9 miles southwest.
BIRDS						
<i>Accipiter cooperii</i>	Cooper's hawk	WL	Breeds in forests and streamside trees where it can hunt its prey by ambush in the dense cover. Has also been known to forage in residential areas.	Low / Species is common in the Project vicinity, being frequently observed at the Freshwater Farms Reserve. Limited nesting habitat is present on site.	Moderate / Species is common in the Project vicinity. Suitable nesting habitat is present in the forest adjacent to the western border of the project site.	High / Species is common in the Project vicinity. Suitable nesting habitat is present along Ryan Creek.
<i>Accipiter striatus</i>	Sharp-shinned hawk	WL	Breeds in woodland habitat. Typically forages in areas of dense cover where it can ambush its prey.	Low / Species is common in the Project vicinity, being frequently observed at the Freshwater Farms Reserve. Limited nesting	Moderate / Species is common in the Project vicinity. Suitable nesting habitat is present in the forest adjacent to the western border of the project site.	High / Species is common in the Project vicinity. Suitable nesting habitat is present along Ryan Creek.

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
				habitat is present on site.		
<i>Asio flammeus</i>	Short-eared owl	CSC	Occurs in open grasslands, prairies, agricultural fields, marshes, and prairies. Forages on small mammals in these habitats. Nests in a shallow depression on the ground.	Moderate / Suitable foraging habitat is present on site. Species has been observed in the Fay Slough Wildlife Area and Arcata Bottoms located approximately 0.7 miles and 4 miles away from the site respectively. Nesting potential is very limited due to extent of grazing and lack of ground cover.	Moderate / Suitable foraging habitat is present on site. Species has been observed in the Fay Slough Wildlife Area and Arcata Bottoms located approximately 1.3 miles and 4.8 miles away from the site respectively. Nesting potential is very limited due to extent of grazing and lack of ground cover.	None / Suitable foraging habitat is present in the fields adjacent to the project site's eastern border. Dense tree cover creates a barrier on the southern portions of the site.
<i>Athene cunicularia</i>	Burrowing owl	CSC, BCC	Dry, open short grass, treeless plains that are associated with burrowing species. Underground nesting habitat in burrows.	Low / No burrows or ground squirrels were observed during field surveys of the project site. Species has been observed in the Arcata Bottoms located approximately 4 miles away from the site.	Low / No burrows or ground squirrels were observed during field surveys of the project site. Species has been observed in the Arcata Bottoms located approximately 4.8 miles from the site.	None / Suitable habitat is present in the fields adjacent to project site's eastern border. Habitat within the study area itself is limited.

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
<i>Brachyramphus marmoratus</i>	Marbled murrelet	FT, SE	Found in coastal waters and bays. Breeds in low-elevation old-growth forests, generally in the fog belt near the coast.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	Low / Forest habitat on the site is poor nesting habitat. Nearest nesting occurrence (Occ. #61) is approximately 7.6 miles southeast.
<i>Charadrius alexandrinus nivosus</i>	Western snowy plover	FT, CSC, BCC	Breeds on sandy beaches, dunes, salt flats, and mud flats.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.
<i>Charadrius montanus</i>	Mountain plover	CSC, BCC	Winters from September to mid-March in valleys and plains in the Sacramento and San Joaquin Valley.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.
<i>Chaetura vauxi</i>	Vaux's swift	CSC	Vaux's swift occurs as a breeding resident in the Sierra Nevada, Cascade, and Coastal ranges of California. This species nests in redwood and Douglas-fir forest in large hollow trees or snags.	Low / Species is regularly observed in the Humboldt Bay region during the breeding season. No suitable nesting habitat is present on site.	Moderate / Species is regularly observed in the Humboldt Bay region during the breeding season. Potentially suitable habitat is present in the forest adjacent to	High / Species was observed at Ryan Creek during the breeding season. Suitable nesting habitat is present in the forests that surround the project site and Ryan Creek.

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Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
					the Project's western border.	
<i>Circus cyaneus</i>	Northern harrier	CSC	Forages and nests in freshwater and brackish marshes and their adjacent grasslands.	High / Species was observed during surveys foraging in fields adjacent to The site. Nesting habitat onsite is poor quality due to cattle grazing and lack of dense vegetation.	High / Species was observed during surveys. Potentially suitable nesting habitat occurs 500 feet of the project site.	Moderate / No suitable habitat is present at the project site, but suitable foraging and potential breeding habitat are located within 500 feet of the project site.
<i>Coccyzus americanus occidentalis</i>	Western yellow-billed cuckoo	FT, SE, CSC, BCC	During the summer breeding season, it can be rarely found in valley foothill and desert riparian habitats in California. Typically breeds in dense deciduous riparian vegetation.	None / There is no suitable habitat located at the project site.	Low / Marginally suitable habitat present along the Ryan Creek riparian corridor. Very rare in the Arcata Bay area. Nearest occurrence (Occ. #173) is approximately 13.9 miles southwest.	Low / Suitable habitat is present along the Ryan Slough riparian corridor at the project site. Very rare in the Arcata Bay area. Nearest occurrence (Occ. #173) is approximately 13.5 miles southwest.

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Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
<i>Contopus cooperi</i>	Olive-sided Flycatcher	CSC, BCC	This insectivorous, neotropical migrant often breeds in ecotones between forest and open habitats, typically with prominent habitat features on which to perch, and from which to locate and catch prey.	Low / Relatively rarely seen in the Humboldt Bay area. Infrequently seen at the Freshwater Farms Reserve located approximately 1.2 miles southeast.	Moderate / Infrequently seen at the Freshwater Farms Reserve located approximately 1 mile east. Suitable habitat is present at the project site.	Moderate / Infrequently seen at the Freshwater Farms Reserve located approximately 1.2 miles northeast. Suitable habitat is present at the project site.
<i>Coturnicops noveboracensis</i>	Yellow rail	CSC, FSS, BCC	Shallow grassy marshes, sometimes brackish, and wet meadows. Also found in rice fields.	Low / Suitable habitat present near the site at Dead Mouse Marsh, located immediately west of the project site on the opposite side of Freshwater Slough. Very rare in the Arcata Bay area. Nearest occurrence (Occ #8) is from 1884 at the mouth of Freshwater Slough.	Low / No suitable habitat at the project site. Marginally suitable habitat present in marsh located within 500 feet of the Project's northern border. Nearest occurrence (Occ. #8) was from 1884 at the mouth of Freshwater Slough.	None / There is no suitable habitat located at the project site.
<i>Elanus leucurus</i>	White-tailed kite	FP	Rolling foothills / valley margins with scattered oaks and river bottomlands or marshes next to	High / Species was observed foraging in pastureland northeast of the project. Suitable foraging	High / Suitable foraging habitat present on site. Suitable nesting habitat present in the	Moderate / Suitable foraging habitat present within 500 feet of the project site. Suitable nesting

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Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
			deciduous woodland. Forages over grasslands, marshes, and oak savannas close to isolated, dense-topped trees for nesting and perching.	habitat is present on site. Nesting habitat is very limited within 500 feet of the Project.	forest adjacent to the site's western border.	habitat present in the riparian corridor of Ryan Creek and the forest margins near the site.
<i>Empidonax traillii</i>	Willow flycatcher	SE, BCC, FSS	Found in thickets of deciduous trees and shrubs, often near a stream or marsh. Often nest in willow trees and shrubs.	Low / Poor quality habitat is present on site.	Moderate / Marginally suitable habitat is present along the Ryan Slough riparian corridor. Relatively common in the Arcata Bay area and at the Freshwater Farms Reserve located approximately 1 mile east.	Moderate / Suitable habitat present along the Ryan Creek riparian corridor and the forested wetlands adjacent to the project site. Relatively common in the Arcata Bay area and at the Freshwater Farms Reserve located approximately 1.2 miles northeast.
<i>Haliaeetus leucocephalus</i>	Bald eagle	SE, FP, FSS, BCC	Associated with permanent water sources including lakes, reservoirs, and large free-flowing rivers with	Low / No suitable nesting habitat within 500 feet of site. Potential for species to use trees on site to perch and forage	Moderate / Suitable foraging habitat is present on site. Nesting habitat adjacent to the site is present but limited.	Moderate / Suitable nesting habitat is present in the forests adjacent to the site. Dense canopy cover over Ryan Creek limits

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

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			abundant fish and nearby old-growth trees or snags for perching, roosting, and nesting. It roosts communally in winter in dense, uneven-aged conifer stands with old-growth components in proximity to feeding areas. It is a permanent resident in northern California and an uncommon winter migrant in the south of the state	from. Species commonly seen in the Arcata Bay area.	Species commonly seen in the Arcata Bay area.	foraging opportunities. Species commonly seen in the Arcata Bay area.
<i>Melanerpes lewis</i>	Lewis's woodpecker	BCC	Winter resident of Central Valley Oak savannas and open coniferous and deciduous forests.	None / There is no suitable habitat located at the project site.	Low / Limited habitat present on site. No known occurrences in Humboldt County. Very rare in the Arcata Bay Area.	Low / Limited habitat present on site. No known occurrences in Humboldt County. Very rare in the Arcata Bay Area.
<i>Pandion haliaetus</i>	Osprey	WL,	Occurs throughout California except within the deserts and Great Basin. It breeds in large	Moderate / Suitable foraging habitat is present on site. Nesting habitat is limited and relatively	Moderate / Suitable foraging habitat is present on site. Nesting habitat is limited. Nearest	High / Nesting habitat is present at the project site. Species is commonly seen in the Arcata Bay Area. Nest

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			trees, snags, and dead-topped trees in open forest in northern California from the Cascade Range to Marin County along the coast, and to the southern Sierra Nevada range. Nests are situated near ocean shores, bays, lakes, river, and large streams, which are required for foraging primarily on fish.	poor quality. Nearest known nest occurrence (Occ. #107) is approximately 1.2 miles south.	known nest occurrence (Occ. #107) is approximately 0.4 miles south.	was found in 1998 approximately 650 feet east of the sink hole location (Occ. #107).
<i>Pelecanus occidentalis californicus</i>	California brown pelican	CSC, FP	Builds nests of sticks on the ground, typically on islands or offshore rocks. The breeding season is March to early August.	Low / Species is rarely seen in the Humboldt Bay area. No official occurrences in Humboldt County. No suitable nesting habitat on site. Limited foraging habitat present in Freshwater Slough	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
<i>Phalacrocorax auritus</i>	Double-crested cormorant	WL	Found in a variety of aquatic habitats including coasts, lakes, rivers, and bays. Often nests in trees over water in large colonies but also breeds on sea cliffs and on the ground. The species sensitive listing status is due to its colonial nesting behavior known as "rookeries". Rookeries are protected	Low / Species common in the Project Area. No suitable nesting habitat present. Nearest recorded rookery is approximately 16.5 miles north.	Moderate / Species common in the Project Area. Poor quality nesting habitat present in the redwood forest to the west of the project site. Nearest recorded rookery is approximately 17.2 miles north.	Moderate / Species is common in the area and could use Freshwater Slough as foraging habitat. Suitable nesting habitat is present. Nearest recorded rookery is approximately 17.7 miles north.
<i>Poecile atricapillus</i>	Black-capped chickadee	WL	Inhabits both deciduous and coniferous forests in the northern United States through Canada and into Alaska. Nests in natural cavities or nest boxes in trees.	Moderate / Species is common in the Humboldt Bay area. Marginally Suitable habitat is present along Freshwater Slough. Poor nesting habitat is present at the project site.	High / Species is common in the Humboldt Bay area. Suitable habitat is present in the forest adjacent to the project site's western border.	High / Species was observed during field surveys. Suitable habitat is present throughout the forested portions of the project site.

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

Scientific Name	Common Name	Status ¹	Habitat	R-354 Likelihood of Occurrence / Rationale	R-519 (L-137C) Likelihood of Occurrence / Rationale	RT-102 (L-177A) Likelihood of Occurrence / Rationale
<i>Rallus obsoletus obsoletus</i>	California Ridgway's rail	FE, SE, FP	Requires marshland or sloughs with direct tidal influence.	Low / Poor quality habitat is present along Freshwater Slough. The nearest occurrence (Occ. #56) is approximately 2.5 miles away, was last seen in 1932 and is now considered to be extirpated.	Low / Poor quality habitat is present along Ryan Slough and the adjacent marsh to the north of the project site. The nearest occurrence (Occ. #56) is approximately 3 miles away, was last seen in 1932 and is now considered to be extirpated.	None / There is no suitable habitat located at the project site.
<i>Riparia riparia</i>	Bank swallow	ST,	Can be found along rivers and streams along the steep eroded banks where they nest. Can also be found nesting in quarries and road cuts.	Low / Poor quality habitat is present on the banks of Freshwater Slough. Species is relatively uncommon in the Arcata Bay area.	Low / Poor quality habitat is present on the banks of Ryan Slough. Species is relatively uncommon in the Arcata Bay area.	Low / Poor quality habitat is present on the banks of Ryan Creek. Species is relatively uncommon in the Arcata Bay area.
<i>Setophaga petechia</i>	Yellow warbler	CSC	Usually found in riparian deciduous habitats of cottonwoods, willows, alders, and other small trees and shrubs typical of	Low / Poor quality habitat is present along Freshwater Slough through the reach of the project site. Frequently observed at the	Moderate / Marginally suitable habitat present along the Ryan Slough riparian corridor. Frequently observed at the Freshwater	High / Species was observed in the riparian corridor along Ryan Creek. Frequently observed at the Freshwater Farms Reserve located

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			low, open-canopy riparian woodland. Gleans and hovers in upper canopy of deciduous trees and shrubs, feeding on insects and spiders.	Freshwater Farms Reserve located approximately 1.2 miles southeast.	Farms Reserve located approximately 1 mile east.	approximately 1.2 miles northeast.
<i>Strix occidentalis caurina</i>	Northern spotted owl	FT, ST, CSC	Typically occurs in unlogged, expansive coniferous forests with dense canopies and large trees.	None / There is no suitable habitat located at the project site.	Low / Poor quality habitat present in the redwood forest adjacent to the eastern edge of the project site. The nearest territory (HUM0987) is centrally located approximately 2.3 miles south with the nearest sighting being approximately 1.5 miles SSE (record from 1982).	Low / Poor quality fragmented habitat is present in the redwood forests surrounding the project site. The nearest territory (HUM0987) is located approximately 1.8 miles south with the nearest sighting being approximately 1.1 miles SSE (record from 1982).
MAMMALS						
<i>Arborimus albipes</i>	White-footed vole	CSC	Associated nearly exclusively with Douglas-fir trees and occasionally grand fir, hemlock, or	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	Low / Marginally suitable habitat is present in the forested portions of the project

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			spruce trees within the North Coast fog belt between the northern Oregon border and Sonoma County.			site. Nearest occurrence (Occ. #5) is located approximately 8.8 miles northeast.
<i>Arborimus pomo</i>	Sonoma tree vole	CSC	Typically found in old growth Douglas-fir forests but also occurs in mixed evergreen forests or younger Douglas-fir forests.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	Low/ Fragmented habitat present in the forests surrounding the Project site. Nearest occurrence (Occ. #63) is located upstream on Freshwater Slough approximately 5.7 miles southeast.
<i>Antrozous pallidus</i>	Pallid bat	CSC	Inhabits grasslands, shrublands, woodlands, and coniferous forests in open, dry habitats that contain rocky areas for roosting.	Low / Poor quality habitat is present at the project site. Nearest occurrence (Occ. #148) is from 1924 and is approximately 15.6 miles southwest.	Low / Limited habitat is present at the project site. Nearest occurrence (Occ. #148) is from 1924 and is approximately 15 miles southwest.	Low / Limited habitat is present at the project site. Nearest occurrence (Occ. #148) is from 1924 and is approximately 14.5 miles southwest.
<i>Bassariscus astutus</i>	Ringtail cat	FP	Occurs in a variety of habitats including montane conifer forests, riparian corridors, oak woodlands, pinyon	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	Low / Poor quality suitable habitat present within the vicinity of the project site. There are no

Table 3. Special-Status Species Potentially Occurring in the Vicinity of the PG&E Pipeline Maintenance Project Sites

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			pine woodlands, juniper woodlands rocky outcroppings, canyons, or talus slopes and can be found in semi-arid country, deserts, and chaparral, as well as close to human disturbance.			CNDDDB occurrences of this species in Humboldt County. Species has been found as roadkill along Highway 299 approximately 30 miles northeast.
<i>Lasiurus blossevillei</i>	Western red bat	CSC	Roosts in woodland habitats and feeds over a variety of habitats including grasslands and shrublands. referred roost sites are protected from above, open below, and located above dark ground cover.	None / There is no suitable habitat located at the project site.	Low / Potentially suitable habitat present at the project site. Nearest occurrence (Occ. #125) is approximately 30.5 miles south.	Low / Potentially suitable habitat present at the project site. Nearest occurrence (Occ. #125) is approximately 30 miles south.
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	CSC, FSS	Coniferous forests, deciduous riparian woodlands, and semi-desert and montane shrub lands. Roost in dark places like caves and buildings.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.	None / There is no suitable habitat located at the project site.

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<i>Pekania pennant</i>	Fischer – West Coast DPS	FC	Intermediate to large-tree stage of coniferous forest and deciduous riparian woodland with high percent canopy closure. Needs large expanses of mature, dense forest.	None / There is no suitable habitat located at the Project Site.	Low / Poor quality habitat in redwood forest adjacent to site. Coniferous forest near this location is too fragmented.	Low / Poor quality habitat in redwood forest at this site. Coniferous forest near this location is too fragmented.
¹ Status: FE = Federal Endangered FT = Federal Threatened FC = Federal Candidate SE = California State Endangered ST = California State Threatened SC = California State Candidate FP = CDFW Fully Protected		CRPR 1B.1 = Threatened in California and elsewhere, seriously threatened in California CRPR 1B.2 = Threatened in California and elsewhere, moderately threatened in California CRPR 2B = Plants rare, threatened, or endangered in California but more common elsewhere CRPR 3 = Plants about which more information is needed CRPR 4 = Plants of limited distribution CSC = California Species of Special Concern FSS = USFS Sensitive Species BCC = USFWS Bird of Conservation Concern IUCN LC = International Union for the Conservation of Nature – Least Concern				

4.9.1 Special-Status Plants

This section includes a discussion of special-status plant species that are known to occur or have potential to occur at the project sites based on habitat availability and known locations of species within the vicinity of the Project sites. Certain species, such as dune inhabiting species, listed in Table 3 above, may occur within the quadrangle and/or within five miles of the project sites; however, based upon a thorough analyses of the Project sites, were determined to be absent due to a lack of suitable habitat for these species and, therefore, are not included in this section. Other species may have been eliminated from consideration because the project sites are beyond the recorded geographic and/or elevational range for these species.

4.9.1.1 Sea watch (*Angelica lucida*) is a California Rare Plant Rank (CRPR) 4.2 species. It is a perennial herbaceous plant species that is found in coastal bluff scrub, coastal dunes, coastal scrub, and coastal salt marsh habitat at elevations ranging from 0 to 164 feet above sea level. This species blooms from May to September. This species occurs on the R-519 site and the R-354 site (Stillwater Sciences, 2018; Stillwater Sciences, 2019). On the R-519 site, over 60 individuals of this species were documented within the salt marsh located along the south bank of Ryan Slough in the northern and northeastern portion of the Project Study Area (Stillwater Sciences, 2018). On the R-354 site, several individuals were documented along the levee north of Freshwater Slough and within the salt marsh on the south side of Freshwater Slough within the Project Study Area (Stillwater Sciences, 2019). This species was recorded on the levee north of Freshwater Slough within the proposed impact footprint, and the project has the potential to impact individuals of this plant.

4.9.1.2 Seaside bittercress (*Cardamine angelica*) is a CRPR 2B.1 species. It is a perennial herbaceous species that blooms from March to July. It occurs in wet areas and on streambanks in lower montane coniferous forest and in North Coast coniferous forest habitats at elevations of 80 to 3,000 feet above sea level. This species was not detected during rare plant surveys conducted for the R-354, R-519, and RT-102 sites (Stillwater Sciences, 2018a; Stillwater Sciences, 2018b; Stillwater Sciences, 2019) and is not expected to occur within the Project impact areas.

4.9.1.3 Northern clustered sedge (*Carex arcta*) is a CRPR 2B.2 species. Northern clustered sedge is a perennial herbaceous species that blooms from June to September and occurs in bogs and fens and North Coast coniferous forest habitat at elevations of 195 to 4,593 feet above sea level. This species was not detected during rare plant surveys conducted for the R-354, R-519, and RT-102 sites (Stillwater Sciences, 2018a; Stillwater Sciences, 2018b; Stillwater Sciences, 2019) and is not expected to occur within the Project impact areas.

4.9.1.4 Lyngbye's sedge (*Carex lyngbyei*) is a CRPR 2B.2 species. Lyngbye's sedge is a perennial, rhizomatous herbaceous species that blooms from April to August and occurs in brackish or freshwater marsh habitat at elevations of 0 to 35 feet above sea level. This species was recorded on all three sites. At the R-354 site, an occurrence of approximately 40 individuals of this species occurs within the tidal salt marsh location on the south side of Freshwater Slough (Stillwater Sciences, 2019); at the R-519 site, this species occurs

along the banks of Ryan Slough throughout the Project Study area (Stillwater Sciences, 2018a); and at RT-102 this species occurs on the west bank of Ryan Creek upstream of the sinkhole location (Stillwater Sciences, 2018b). This species was recorded at the pipeline crossing location on Ryan Slough, and the project has the potential to impact individuals of this plant during removal of the existing pipeline crossing.

4.9.1.5 Northern meadow sedge (*Carex praticola*) is a CRPR 2B.2 species. Northern meadow sedge is a perennial herbaceous species that blooms from May to July and occurs in mesic meadows and seep habitat at elevations of 0 to 10,500 feet above sea level. This species was not detected during rare plant surveys conducted for the R-354, R-519, and RT-102 sites (Stillwater Sciences, 2018a; Stillwater Sciences, 2018b; Stillwater Sciences, 2019) and is not expected to occur within the Project impact areas.

4.9.1.6 Humboldt Bay owl's clover (*Castilleja ambigua* var. *humboldtiensis*) is a CRPR 1B.2 species. Humboldt Bay owl's clover is an annual herbaceous, and hemiparasitic, species that blooms from April to August and occurs in coastal salt marsh habitat at elevations of 0 to 10 feet above sea level. This species was recorded during rare plant surveys at the R-354 site and the R-519 site. At the R-354 site, this species occurs within the tidal salt marsh south of Freshwater Slough, where a population of approximately 350 individuals were recorded. Additionally, there was a small occurrence, composed of just a few individuals on the levee north of Freshwater Slough (Stillwater Sciences, 2019). At the R-519 site, this species occurs along the south bank of Ryan Slough in the northeastern portion of the Project Study area and along the east bank of Ryan Slough in the southern portion of the Project Study Area (Stillwater Sciences, 2018a). These occurrences are all located outside the Project impact footprints at both locations and this species is not expected to be impacted by the Project.

4.9.1.7 Coast fawn lily (*Erythronium revolutum*) is a CRPR 2B.2 species. Coast fawn lily is a perennial herbaceous (bulb) species that blooms from March to July and occurs on mesic streambanks, in bogs and fens, in broad-leaved upland forest, and in North Coast coniferous forest habitat at elevations of 0 to 5,250 feet above sea level. This species was not detected during rare plant surveys conducted for the R-354, R-519, and RT-102 sites (Stillwater Sciences, 2018a; Stillwater Sciences, 2018b; Stillwater Sciences, 2019) and is not expected to occur within the Project impact areas.

4.9.1.8 Minute pocket moss (*Fissidens pauperculus*) is a CRPR 1B.2 species. Minute pocket moss is a moss species that occurs on damp coastal soil in North Coast coniferous forest at elevations of 30 to 3,360 feet above sea level. This species was not detected during rare plant surveys conducted for the R-354, R-519, and RT-102 sites (Stillwater Sciences, 2018a; Stillwater Sciences, 2018b; Stillwater Sciences, 2019) and is not expected to occur within the Project impact areas.

4.9.1.9 Marsh pea (*Lathyrus palustris*) is a CRPR 2B.2 species. Marsh pea is a perennial herbaceous species that blooms from March to August and occurs on mesic bogs and fens, coastal prairie, coastal scrub, lower montane coniferous forest, marshes, and North Coast coniferous forest habitat at elevations of 0 to 330 feet above sea level. This species was not detected during rare plant surveys conducted for the R-354, R-519,

and RT-102 sites (Stillwater Sciences, 2018a; Stillwater Sciences, 2018b; Stillwater Sciences, 2019) and is not expected to occur within the Project impact areas.

4.9.1.10 Running-pine (*Lycopodium clavatum*) is a CRPR 4.1 species. Running-pine is a perennial, rhizomatous, herbaceous species that blooms from June to August and occurs in lower montane coniferous forest, marshes, and North Coast coniferous forest habitat often at edges, openings, and along roadsides. This species occurs at elevations of 145 to 4,019 feet above sea level. This species was not detected during rare plant surveys conducted for the R-354, R-519, and RT-102 sites (Stillwater Sciences, 2018a; Stillwater Sciences, 2018b; Stillwater Sciences, 2019) and is not expected to occur within the Project impact areas.

4.9.1.11 Ghost-pipe (*Monotropa uniflora*) is a CRPR 2B.2 species. Ghost-pipe is a perennial herbaceous, and parasitic species that blooms from June to August and occurs in broadleafed upland forest and North Coast coniferous forest habitat at elevations of 30 to 1,805 feet above sea level. This species was not detected during rare plant surveys conducted for the R-354, R-519, and RT-102 sites (Stillwater Sciences, 2018a; Stillwater Sciences, 2018b; Stillwater Sciences, 2019) and is not expected to occur within the Project impact areas.

4.9.1.12 Howell's montia (*Montia howellii*) is a CRPR 2B.2 species. Howell's montia is an annual herbaceous species that blooms from March to May and occurs in vernal mesic meadows and seeps, vernal pools, and North Coast coniferous forest habitat at elevations of 0 to 2,740 feet above sea level. This species was not detected during rare plant surveys conducted for the R-354, R-519, and RT-102 sites (Stillwater Sciences, 2018a; Stillwater Sciences, 2018b; Stillwater Sciences, 2019) and is not expected to occur within the Project impact areas.

4.9.1.13 Maple-leaved checkerbloom (*Sidalcea malachroides*) is a CRPR 4.2 species. Maple-leaved checkerbloom is a perennial herbaceous species that blooms from April to August and occurs in broad-leafed upland forest, coastal prairie, coastal scrub, North Coast coniferous forest, and riparian woodland habitat, often in disturbed areas. This species occurs at elevations of 0 to 2,395 feet above sea level. This species was not detected during rare plant surveys conducted for the R-354, R-519, and RT-102 sites (Stillwater Sciences, 2018a; Stillwater Sciences, 2018b; Stillwater Sciences, 2019) and is not expected to occur within the Project impact areas.

4.9.1.14 Siskiyou checkerbloom (*Sidalcea malvaflora*) is a CRPR 1B.2 species. Siskiyou checkerbloom is a perennial, rhizomatous, herbaceous species that blooms from May to August and occurs in coastal bluff scrub, coastal prairie, and North Coast coniferous forest, often in roadcuts. This species occurs at elevations of 45 to 2,885 feet above sea level. This species was not detected during rare plant surveys conducted for the R-354, R-519, and RT-102 sites (Stillwater Sciences, 2018a; Stillwater Sciences, 2018b; Stillwater Sciences, 2019) and is not expected to occur within the Project impact areas.

4.9.1.15 Coast checkerbloom (*Sidalcea oregana* ssp. *eximia*) is a CRPR 1B.2 species. Coast checkerbloom is a perennial herbaceous species that blooms from June to August and occurs in lower montane coniferous forest, meadows and seeps, and North Coast coniferous forest habitats at elevations of 15 to 4,395 feet above sea level. This species

was not detected during rare plant surveys conducted for the R-354, R-519, and RT-102 sites (Stillwater Sciences, 2018a; Stillwater Sciences, 2018b; Stillwater Sciences, 2019) and is not expected to occur within the Project impact areas.

4.9.1.16 Western sand spurry (*Spergularia canadensis* var. *occidentalis*) is a CRPR 2B.1 species. Western sand spurry is an annual herbaceous species that blooms from June to August and occurs in coastal salt marsh habitat at elevations of 0 to 10 feet above sea level. This species was recorded during rare plant surveys at the R-354 site but was not detected during rare plant surveys at the R-519 or RT-102 sites (Stillwater Sciences, 2018a; Stillwater Sciences, 2018b; Stillwater Sciences, 2019). At the R-354 site, this species occurs in two locations: the largest occurrence of approximately 160 individuals was a previously known CNDDDB occurrence in the tidal salt marsh habitat south of Freshwater Slough and a second occurrence of approximately 40 individuals was located along the steep eroded bank of the levee north of Freshwater Slough (Stillwater Sciences, 2019). This species was recorded on the levee north of Freshwater Slough within the proposed impact footprint, and the project has the potential to impact individuals of this plant.

4.9.2 Special-Status Wildlife

This section includes a discussion of special-status wildlife species that are known to occur or have potential to occur at the project sites based on habitat availability and known locations of species within the vicinity of the Project sites. Certain species, such as salt marsh species or montane species, listed in Table 3 above, may occur within the quadrangle and/or within five miles of the project sites; however, based upon a thorough analyses of the Project sites, were determined to be absent due to a lack of suitable habitat for these species and, therefore, are not included in this section. Other species may have been eliminated from consideration because the project sites are beyond the recorded geographic and/or elevational range for these species. Additionally, species such as California floater (*Anodonta californiensis*) are not included because they are considered Forest Service Sensitive and are a concern on Forest Service Lands; however, they do not meet the CEQA definition of rare or endangered (see Section 15380 of the State CEQA Guidelines).

4.9.2.1 Pacific lamprey (*Entosphenus tridentatus*) is a California Species of Special Concern and a Forest Service Sensitive Species that is found in nearly all California streams entering the Pacific Ocean, unless blocked by barriers or low flows. The adults often start their spawning migration from the ocean into freshwater in the fall and can be seen moving upstream throughout the winter and early spring except during high water. In some rivers these migrations continue into late spring. Pacific lampreys construct nests for spawning. They dig shallow depressions in stream riffles by moving stones with their suckorial mouth. The eggs are deposited in the crevices of the rocky nest area, after which the adults die. The eggs hatch and the young lampreys burrow into the stream bottom, where they remain in a larval stage for three or four years. During this time, they feed on material they filter from the water and gradually change into miniature adults. At a length of about six inches, they move into the stream and migrate to the ocean. This species has been documented in Freshwater Slough and its tributaries which flow into Humboldt Bay (Occ. #4). (CDFW, 2019a; Normandeau Associates, 2015).

This species is expected to occur within aquatic portions of all three project sites at some point during the year; however, the time of year with the highest likelihood for occurrence at all three project sites is in winter and/or early spring (Normandeau Associates, 2015).

4.9.2.2 Green sturgeon (*Acipenser medirostris*) -Southern Distinct Population Segment (DPS) is a federally Threatened species and a California Species of Special Concern. This population typically occurs south of the Eel River and was listed as a threatened species by NMFS in April 2006 (NMFS, 2006). Although much of the population occurs south of the Eel river, it also occurs and has been documented in Humboldt Bay (NMFS, 2018). The northern DPS of the green sturgeon also occurs in the Humboldt Bay, but is not a listed species and therefore, is not addressed in this document. Critical habitat for Southern Distinct Population Segment (DPS) green sturgeon was designated in 2009 and includes Humboldt Bay and the R-354 Project site (NMFS, 2009).

Green sturgeon are an anadromous species, but little is known about its biology because they are much less abundant than white sturgeon, and regarded as inferior quality for consumption (Moyle, 2002; NMFS, 2011). The southern DPS is distributed in streams and rivers primarily south of the Eel River, except for recent documented occurrences in Humboldt Bay. On the North Coast and in the region of the Project sites, the southern DPS of the green sturgeon overlaps with the northern DPS green sturgeon, and northern DPS green sturgeon could also occur in Humboldt Bay and near the Project sites (Winzler and Kelly, 2009). In 2007 southern DPS green sturgeon with acoustic tags were detected moving in and out of Humboldt Bay (USFWS, unpublished data). Both northern and southern DPS green sturgeon use Humboldt Bay during summer months, typically entering the bay between April to June and residing until September to October (CDFW, 2019a). Green sturgeons depend on large rivers to spawn. Spawning occurs in deep pools in large turbulent river mainstems (Moyle et al., 1992). In recent years, spawning is only documented in the Sacramento River for the southern DPS green sturgeon and in the Klamath and Rogue Rivers for the northern DPS green sturgeon (Moyle et al., 1992; CDFG, 2002; Erickson et al., 2001; Rien et al., 2001). Details of spawning locations are not known.

Green sturgeon abundance and distribution in and around Humboldt Bay has not been studied. Acoustically tagged green sturgeon were observed breaching within Arcata Channel of Arcata Bay in 2016. The fish observed within Arcata channel were tagged in the Sacramento River in 2011 (Goldsworthy et al., 2016). Nine green sturgeon were collected in 1974 within Humboldt Bay (Winzler and Kelly, 2009). Green sturgeon are known to seasonally reside in Humboldt Bay, arriving between April and June and residing until September or October. Monitoring programs are needed for a better understanding of fine scale habitat use in estuaries (NMFS, 2018). The species may forage in the sloughs on Humboldt Bay, and could occur in the project site locations; however, likelihood of occurrence is low, and the pipeline maintenance project sites do not provide suitable spawning habitat.

4.9.2.3 Tidewater goby (*Eucyclogobius newberryi*) is a federally Endangered and California Species of Special Concern that inhabits brackish water habitats along the California coast. It is a small fish rarely exceeding 5.1 cm (2.0 in) in length, and all life

stages occur in the upper end of lagoons with salinities ranging from 5 to 20 parts per thousand (ppt). They lack a marine phase, and estuaries with a more permanent ocean connection and higher salinities (20-30 ppt) often do not support tidewater gobies. They occur in coastal streams that create deposition berms that dam the mouths of the estuaries for most of the year. The presence of the berms results in lower salinities due to the reduction of exchange flows with the ocean and increases the amount of suitable spawning and rearing habitat.

The nearest occurrence of tidewater goby (Occ # 124) is immediately adjacent to the R-354 project site (CDFW, 2019a; Normandeau Associates, 2015). The same occurrence is approximately 1.1 and 2.5 miles from the R-519 and RT-102 project sites, respectively. This is a 1982 occurrence of 11 juvenile and 14 adult tidewater gobies collected at the Park Street Marsh as part of a study of early fish use of the mitigation marsh after the dike breach in 1980 that restored the marsh to tidal influence (Chamberlain and Barnhart, 1993). A more recent environmental DNA (eDNA) study conducted in 2016 throughout the range of tidewater goby failed to detect tidewater goby in the same location, the Dead Mouse Marsh, also known as Park Street Marsh. The same eDNA study also failed to detect tidewater goby in Freshwater Slough (Sutter, 2018).

Although tidewater goby has never been documented in Ryan Creek or Ryan Slough, Critical Habitat Unit Hum-3i is located in Wood Creek within the upper Freshwater Slough watershed. Tidewater gobies were observed in Wood Creek in 2003 but more recent surveys have failed to detect gobies at this location (Chamberlain, 2011; USFWS, 2013; Sutter, 2018). A report prepared for 2010 surveys conducted by the USFWS for determination of presence of tidewater goby at previously known locations on the north coast reports that although no tidewater goby were encountered at the Wood Creek site as a result of the USFWS 2010 surveys, a single tidewater goby was incidentally captured by the CDFW at Wood Creek in 2010 (Chamberlain, 2011). It is important to note that non-detection of tidewater goby using tow surveys or eDNA surveys, does not necessarily indicate absence. If gobies occur in Wood Creek, they would be present at the R-354 site in Freshwater Slough during migration and dispersal.

Tidewater goby has a moderate likelihood of occurrence at the R-354 and R-519 sites based on historic presence at Park Street Marsh (Dead Mouse Marsh) and a 2003 occurrence at Wood Creek, both within the Freshwater Slough system; however, based on field assessment of the habitat conditions within the Project impact areas at R-354 and R-519 sites, we determined that the temporary impact areas in Freshwater Slough at R-354 and Ryan Slough at R-519 do not support all of the necessary habitat elements for tidewater goby, and does not provide potential spawning habitat within the in-water work areas in Freshwater and Ryan Sloughs.

Other site specific habitat features within the biological study area or near the Project sites that may provide potential habitat for tidewater goby include a tidal pond on the south side of Freshwater Slough near the R-354 Site and a channel on the back side of the Ryan Slough levee near the R-519 Site. The wet depression feature on the north side of the levee within the R-354 biological study area does not have a connection to Freshwater Slough and is not ponded during summer months; therefore, it does not provide sufficient habitat for tidewater goby or a connection to the slough for access during

dispersal. The tidal pond south of Freshwater Slough and the channel on the back side of Ryan Slough may provide suitable habitat for tidewater goby but they do not provide potential spawning habitat within the Project site and will not be impacted by Project activities.

All three project sites are within tidewater goby dispersal range from Humboldt Bay and off-channel potential spawning habitat in the Freshwater Slough watershed; however, tidewater goby populations within stream reaches with no prior documented occurrences indicates that it is unlikely that the species occurs at the project sites on an annual basis. The species could intermittently be found at the project sites but does not consistently occur in the Freshwater Slough watershed. Additionally, tidewater goby is not expected to occur at these locations during the seasonal timeframe that project activities would occur (July 1 – October 15), which coincides with the low flow season and when storm events are unlikely. If gobies are present in the watershed, occurrence at the sites would be most likely during dispersal, which typically occurs during storm events and higher flows. While the Project will temporarily disturb aquatic habitat, Project disturbance will occur at a time when likelihood of occurrence is low, and no permanent habitat loss will occur. Areas of temporary habitat disturbance will be short-term and relatively small compared to the total area of similar habitat in the Freshwater Slough watershed.

4.9.2.4 Coast cutthroat trout (*Oncorhynchus clarkii clarkii*) is a California Species of Special Concern found in the coastal streams of North America from the Eel River in northern California to south central Alaska. They occupy small coastal streams, rivers, and lakes and are closely associated with the temperate rain forests of the Pacific Northwest. They are the only subspecies of cutthroat trout that is anadromous. They are renowned for their complex life history that includes resident, river migrant, lake migrant, and marine migrant forms. Coastal cutthroat trout possess the most variable life history strategies among all Pacific salmonids that are found both between and within populations of the species. There are four main groups of migratory behavior within coastal cutthroats: (1) amphidromous (sea-run) life history, (2) lacustrine life history, (3) riverine (potamodromous) life history, and (4) stream-resident. (Moyle, 2002, Trotter 2008).

Anadromous coastal cutthroat trout spawn first at two to four years of age and may return two to five times to overwinter and spawn. In northern California their migration up spawning streams begins following the first substantial rainfall which usually occurs between August and October. Coastal cutthroat trout spawn in small headwater streams (Trotter, 2008). Alevins emerge as fry between March and June, with peak emergence during mid-April, then spend the summer in backwaters and stream margins (Johnson et al. 1999). Juveniles remain in the upper watershed until approximately one year in age at which point, they may move extensively throughout the watershed.

Extensive surveying of the lower Ryan Creek to determine the use of the stream-estuary ecotone by juvenile salmonids has indicated that cutthroat trout will rear in the Ryan Creek/Slough ecotone for extended periods of time (Normandeau Associates, 2015). Cutthroat trout are expected to be present within the project areas year-round; however, populations are typically highest in winter and spring, because the species moves upstream to cooler waters in summer and fall (Normandeau Associates, 2015).

This species has been documented in the CNDDDB with known occurrences (Occ. # 15) in the Freshwater Slough and Ryan Creek/Slough ecotone (CDFW, 2019a).

4.9.2.5 Coho salmon – southern Oregon / northern California Evolutionarily Significant Unit (ESU) (*Oncorhynchus kisutch*) is a federally Threatened and California Threatened species. In California, Punta Gorda (Humboldt County) is the separation point between California's two coho ESUs, the Southern Oregon-Northern California Coast ESU and the Central California Coast ESU. Spawning migrations begin after increased stream flows in fall and early winter allow the fish to move into coastal rivers. Upstream migration usually occurs when stream flows are either rising or falling. The timing of their return varies considerably, but in general coho salmon return earlier in the season in more northern areas and in larger river systems. Coho salmon in California return to their natal streams to spawn after spending 6-18 months in the ocean (NMFS, 2005a).

Green Diamond Resource Company conducted surveys, between 2002 and 2009 and the data showed that there is an annual run of coho salmon in Ryan Creek that number between several dozen to several hundred adult fish (Green Diamond Resource Company, 2006). Coho spawning occurs between November and late February, with the peak spawning in January. Coho smolt production over the eleven years (2004-2014) on record within Ryan Creek averaged 4,118 smolts per year, with a range of 1,500 to 6,500 per year. Coho smolts outmigration occurred between late March and late June with the peak usually occurring from late April through mid-May (Normandeau Associates, 2015). Once at sea, the species travels to the North Pacific Ocean and will return to spawn anywhere between 6 to 18 months.

Anadromous salmonid use of the Freshwater Creek system has been extensively studied by the CDFW's Anadromous Fisheries Resource Assessment and Monitoring Program and the CDFW Natural Stocks Assessment Project. Fish data available in Freshwater Creek includes weir counts, electrofishing survey data, downstream migrant trapping counts, and red and carcass surveys. These data are collected and analyzed to show fish population trends. In the Freshwater Creek watershed, periods of emigration vary from year to year; however, juvenile coho salmon overwinter survival and pre-spring emigration follow typical seasonal patterns. Pulses of early emigrants leave during high flow events in late fall and winter and smolts leave in mid-to-late April as rains stop and flows decline, and there is little emigration in the period between early summer and late fall (Ricker et al., 2014). Migrant trapping studies conducted between 2001 and 2007 showed that coho salmon spring emigrants in lower mainstem of Freshwater Creek remain relatively consistent. The number and size of coho salmon emigrating from the lower mainstem Freshwater Creek were higher and larger than fish emigrating from upstream tributaries, suggesting that lower mainstem habitat on Freshwater Creek is very important to both quality and quantity of both steelhead and coho salmon smolts in the Freshwater Creek system (Ricker, 2008). The best salmonid spawning and rearing habitat is the upper mainstem Freshwater Creek, above the confluence with Graham Gulch and Coast cutthroat trout, coho salmon, steelhead, and California coastal chinook salmon are known to spawn in the Freshwater Creek system. Ryan Creek is a tributary to Freshwater Slough and part of the Freshwater Creek watershed. Ryan Creek is not included in the CDFW surveys; however, both Freshwater Creek and Ryan Creek are in the Freshwater

watershed and similar patterns are likely. Much of the Ryan Creek watershed is or was owned by Green Diamond Resource Company and managed for timber production. The Green Diamond Resource Company surveys provide most fish data available for the Ryan Creek watershed.

Spawning adults and smolts have been observed in the Freshwater and Ryan Slough Channel System. Green Diamond Resource Company conducted surveys between 2002 and 2009 and the data showed that there is an annual run of coho salmon in Ryan Creek that number between several dozen to several hundred adult fish (Green Diamond Resource Company, 2006). Coho smolt production over the eleven years (2004-2014) on record within Ryan Creek averaged 4,118 smolts per year, with a range of 1,500 to 6,500 per year. Coho smolts outmigration occurred between late March and late June with the peak usually occurring from late April through mid-May.

Poor winter rearing conditions occur in the lower Freshwater Creek watershed (Freshwater Slough/Ryan Slough) due to heavy embedded substrates, lack of riparian cover, poor access to floodplains (channels are constrained by levees), and low levels of large wood complexity in the channel (Humboldt Bay Watershed Advisory Committee and Natural Resource Services District of RCAA, 2005). This portion of the watershed includes habitat simplification including channelization, diking, and removal of instream wood, all of which have negative effects on the quality of fish habitat. There is a lack of backwater channels due to levees in this part of the watershed and a lack of refugia throughout much of the lower reaches of Freshwater Creek/Slough. Rearing habitat in this portion of the watershed is limited (Humboldt Bay Watershed Advisory Committee and Natural Resource Services District of RCAA, 2005). Summer water temperatures in the lower Freshwater watershed are also a limiting factor for fish occurrence. The R-354 site and R-519 site both occur in the lower Freshwater Creek watershed.

The middle reach of Freshwater Creek, defined as the segment between Three Corners and the confluence of Graham Gulch, has levees that confine the channel in the lower reach. Large wood frequency is low, and the riparian zone is narrow. Bank erosion is prevalent and high levels of suspended sediment is a significant factor for water quality. Water temperature is generally not a limiting factor in the middle reach and is typically adequate for salmon survival year-round (Humboldt Bay Watershed Advisory Committee and Natural Resource Services District of RCAA, 2005). Furthermore, studies have shown that the stream-estuary ecotone provides quality rearing habitat for juvenile salmonids, especially over wintering rearing habitat, and particularly in middle reach segments (Wallace et al., 2015). There are no pipeline maintenance projects on the middle reach of Freshwater Creek; however, the RT-102 site on Ryan Creek is similar to middle reach Freshwater Creek conditions.

Extensive surveying of the lower Ryan Creek to determine the use of the stream-estuary ecotone by juvenile salmonids has indicated that coho will rear in the Ryan Creek/Slough ecotone for extended periods of time (Normandeau Associates, 2015). This species has been documented in the CNDDB with known occurrences (Occ. # 8) in the Freshwater Slough and Ryan Creek/Slough ecotone (CDFW, 2019a).

Based on the information above, Coho salmon could be present within the project sites year-round; however, populations are typically highest in winter and spring, because the species moves upstream to cooler waters in summer and fall (Normandeau Associates, 2015). Project activities will be conducted during the aquatic work window (July 1 to October 15), when coho salmon are least likely to be present at the sites. More specifically, construction at R-354 and R-519 will take place in August and September when water temperatures within the sloughs are the highest of the year resulting in dissolved oxygen levels at the lowest of the year. Reduced levels of dissolved oxygen can impact growth and development of all life stages of salmon; therefore, salmon have been documented to have an avoidance response to unfavorable dissolved oxygen levels (Carter, 2005). Coho salmon are expected to be further upstream than the R-354 and R-519 project sites when construction takes place.

4.9.2.6 Steelhead – Northern California DPS (*Oncorhynchus mykiss irideus*) is a federally Threatened species. The Northern extent of the Northern California DPS is Redwood Creek and southern extent is the Gualala River. There are two basic life history types of steelhead. Stream-maturing steelhead enter fresh water with immature gonads and consequently must spend several months in the stream before they are ready to spawn. Stream-maturing steelhead are also referred to as summer steelhead. Stream-maturing steelhead typically enter fresh water in spring, early summer, and possibly fall. They ascend to headwater tributaries, hold over in deep pools until mature and spawn in late fall and winter. Ocean-maturing steelhead mature in the ocean and spawn relatively soon after entry into fresh water. Ocean-maturing steelhead are also referred to as winter steelhead. Ocean-maturing steelhead typically begin their spawning migration in fall and winter and spawn within a few weeks to a few months from the time they enter fresh water. Ocean-maturing steelhead generally spawn in January through March, but spawning can extend into spring and possibly early summer months (NMFS, 2005a; 2016).

Steelhead do not necessarily migrate to the ocean at any set age. Some individuals will remain in a stream, mature, and even spawn without ever going to sea while others will migrate to sea at less than a year old. For steelhead that do migrate to the ocean they typically remain at sea for 1 to 4 growing seasons before returning to fresh water to spawn. Juveniles typically rear in fresh water for a period of one to three years.

All three project sites occur within Critical Habitat for the Northern California DPS of steelhead. Extensive surveying of the lower Ryan Creek to determine the use of the stream-estuary ecotone by juvenile salmonids has indicated that steelhead will rear in the Ryan Creek/Slough ecotone for extended periods of time (Normandeau Associates, 2015). This species has been documented in the CNDDDB with known occurrences (Occ. # 8) within the Freshwater Slough and Ryan Creek/Slough ecotone (CDFW, 2019a).

This species has been documented in Freshwater Slough and its tributaries that flow into Humboldt Bay. Extensive surveying of the lower Ryan Creek to determine the use of the stream-estuary ecotone by juvenile salmonids has indicated that steelhead will rear in the Ryan Creek/Slough ecotone for extended periods of time (Normandeau Associates, 2015). This species has been documented in the CNDDDB with known occurrences (Occ. # 8) within the Freshwater Slough and Ryan Creek/Slough ecotone (CDFW, 2019a). Steelhead could be present within the project areas year-round; however,

populations are typically highest in winter and spring, because the species moves upstream to cooler waters in summer and fall (Normandeau Associates, 2015). Steelhead behavioral response to warmer water with lower oxygen content is similar to that of the coho salmon. Reduced levels of dissolved oxygen can impact growth and development of all life stages of salmonids; therefore, salmonids have been documented to have an avoidance response to unfavorable dissolved oxygen levels (Carter, 2005).

As indicated above, poor winter rearing conditions occur in the lower Freshwater Creek watershed (Freshwater Slough/Ryan Slough) due to heavy embedded substrates, lack of riparian cover, poor access to floodplains (channels are constrained by levees), and low levels of large wood complexity in the channel (Humboldt Bay Watershed Advisory Committee and Natural Resource Services District of RCAA, 2005). This portion of the watershed includes habitat simplification including channelization, diking, and removal of instream wood, all of which have negative effects on the quality of fish habitat. There is a lack of backwater channels due to levees in this part of the watershed and a lack of refugia throughout much of the lower reaches of Freshwater Creek/Slough. Rearing habitat in this portion of the watershed is limited (Humboldt Bay Watershed Advisory Committee and Natural Resource Services District of RCAA, 2005). Summer water temperatures in the lower Freshwater watershed are also a limiting factor for fish occurrence. The R-354 site and R-519 site both occur in the lower Freshwater Creek watershed.

The middle reach of Freshwater Creek, defined as Three Corners to the confluence of Graham Gulch, has levees that confine the channel in the lower reach. Large wood frequency is low and the riparian zone is narrow. Bank erosion is prevalent and high levels of suspended sediment is a significant factor for water quality. Water temperature is generally not a limiting factor in the middle reach and is typically adequate for salmon survival year-round (Humboldt Bay Watershed Advisory Committee and Natural Resource Services District of RCAA, 2005). There are no pipeline maintenance projects on the middle reach of Freshwater Creek; however, the RT-102 site on Ryan Creek is similar to middle reach Freshwater Creek conditions.

Steelhead could be present within the project areas year-round; however, populations are typically highest in winter and spring, because the species moves upstream to cooler waters in summer and fall (Normandeau Associates, 2015). Steelhead behavioral response to warmer water with lower oxygen content is similar to that of the coho salmon. Project activities will be conducted during the aquatic work window (July 1 to October 15), when steelhead are least likely to be present at the sites. More specifically, construction at R-354 and R-519 will take place in August and September when water temperatures within the sloughs are the highest of the year resulting in dissolved oxygen levels at the lowest of the year. Reduced levels of dissolved oxygen can impact growth and development of all life stages of salmonids; therefore, salmonids have been documented to have an avoidance response to unfavorable dissolved oxygen levels (Carter, 2005). Steelhead are expected to be further upstream than the R-354 and R-519 project sites when construction takes place.

4.9.2.7 Chinook salmon – California Coastal ESU (*Oncorhynchus tshawytscha*) is a federally Threatened species. NOAA Fisheries has separated this species into 17 distinct

groups or evolutionary significant units (ESUs) based on similarity in life history, location, and genetic markers. The California Coastal Chinook salmon is the ESU occurring in the project area. Chinook salmon is an anadromous species spending most of its adult life in the ocean and then returning to freshwater streams to spawn. They spend 3-6 years maturing in the ocean before they immigrate upstream to spawn. Adult Chinook salmon die after spawning. Juveniles spend from several months to over a year rearing in their natal streams before emigrating to the ocean. Preferred spawning grounds for Chinook salmon are in gravel areas of large rivers and tributaries (NMFS, 2005a; 2005b).

Adult Chinook salmon return to the Humboldt Bay as early as late August, but most migration occurs between September and November, and spawning typically peaks between October and December. Unlike coho salmon and steelhead, young Chinook salmon begin their outmigration soon after emerging from the gravel. Freshwater residence in coastal California stocks usually ranges from two to four months, and juveniles in the watershed emigrate as fingerlings from late February through June.

As indicated above, poor winter rearing conditions occur in the lower Freshwater Creek watershed (Freshwater Slough/Ryan Slough) due to heavy embedded substrates, lack of riparian cover, poor access to floodplains (channels are constrained by levees), and low levels of large wood complexity in the channel (Humboldt Bay Watershed Advisory Committee and Natural Resource Services District of RCAA, 2005). This portion of the watershed includes habitat simplification including channelization, diking, and removal of instream wood, all of which have negative effects on the quality of fish habitat. There is a lack of backwater channels due to levees in this part of the watershed and a lack of refugia throughout much of the lower reaches of Freshwater Creek/Slough. Rearing habitat in this portion of the watershed is limited (Humboldt Bay Watershed Advisory Committee and Natural Resource Services District of RCAA, 2005). Summer water temperatures in the lower Freshwater watershed are also a limiting factor for fish occurrence. The R-354 site and R-519 site both occur in the lower Freshwater Creek watershed.

The middle reach of Freshwater Creek, defined as Three Corners to the confluence of Graham Gulch, has levees that confine the channel in the lower reach. Large wood frequency is low and the riparian zone is narrow. Bank erosion is prevalent and high levels of suspended sediment is a significant factor for water quality. Water temperature is generally not a limiting factor in the middle reach and is typically adequate for salmon survival year-round (Humboldt Bay Watershed Advisory Committee and Natural Resource Services District of RCAA, 2005).

There are no pipeline maintenance projects on the middle reach of Freshwater Creek; however, the RT-102 site on Ryan Creek is similar to middle reach Freshwater Creek conditions. Chinook salmon have been documented moving into lower reaches of Humboldt Bay tributaries to rear prior to entering the ocean, which is why the lower reaches of Ryan and Freshwater slough have been designated as California Coastal ESU Critical habitat for the species. This critical habitat unit includes the R-354 and R-519 project sites; however, the RT-102 project site is located just outside the critical habitat boundary. Chinook salmon have been collected at a permanent weir 3.1 miles upstream of the mouth of Freshwater Slough (CDFW, 2019a; Normandeau Associates, 2015). The

species was caught one of eleven years (200-2014) within in the rotary screw trap operated by Green Diamond Resource Company located in Lower Ryan Creek. This could indicate that Ryan Creek is rarely used as spawning habitat for the species. This species could occur at R-354 and R-519 and adjacent to the RT-102 within Ryan Creek; however, the species will be at its lowest population during construction activities, which are scheduled to occur during the aquatic work window (July 1-October 15) during the low flow season and when conditions are least favorable for salmonid occurrence due to high water temperature and low dissolved oxygen .

Longfin smelt (*Spirinchus thaleichthys*) is a California Threatened species and a California Species of Special Concern. Humboldt Bay populations of longfin smelt are not part of the candidate for review status as designated by the USFWS (2012). Longfin smelt spend their adult life in bays, estuaries, and nearshore coastal areas, and migrate into low salinity or freshwater reaches of coastal rivers and tributary streams to spawn (Moyle, 2002). Spawning occurs primarily from January through March, after which most adults die (Moyle, 2002). They immigrate upstream to spawn in brackish water between January and April. Adhesive eggs are deposited on rocks or aquatic plants. The decline in longfin smelt abundance is primarily associated with the diversion of freshwater in California. Another contributing factor is reproductive failure during drought years. Consecutive drought years leading to reproductive failure could result in the extirpation of longfin smelt because of their two-year life cycle (Goals Project, 2000).

Longfin smelt have been reported utilizing eel grass beds within Humboldt Bay and have been captured in tributary sloughs (Chamberlain and Barnhart 1993; Pinnix et al. 2005). Longfin smelt have been occasionally caught in Freshwater Slough and lower Freshwater Creek (Wallace, 2014a). Most recently CDFW surveys captured 17 longfin smelt adults in mid-December 2014 in upper Freshwater slough 5.7 miles upstream of Humboldt Bay and 2.6 miles upstream of Ryan Slough confluence (Wallace, 2014b). CDFW surveys upstream of the project area have also captured surf smelt, a coastal nearshore marine fish species (Wallace, 2014a).

4.9.2.8 This species is expected to occur at the R-354 and R-519 projects sites during migration. It is less likely that longfin smelt will occur at the R-102 project, but the species could be present in Ryan Creek during migration. Construction activities will take place when the species is least likely to be present in the project area. Northern red-legged frog (*Rana aurora*) (NRLF) is a California Species of Special Concern and a U.S. Forest Service Sensitive species. The subspecies ranges from Mendocino County in northern California through Oregon and Washington into southwest British Columbia and overlaps with the California red-legged frog (*Rana draytonii*) between Point Arena and Elk in Mendocino County. It is found in humid forests, woodland, grasslands, and streams from sea level to about 4,680 feet msl. Breeding habitat is in permanent water sources (lakes, ponds, reservoirs, slow streams, marshes, bogs, and swamps). While typically associated with aquatic habitats, it can be terrestrial and found in damp places away from water. Breeding occurs in January and February. Females lay between 750 and 1,300 eggs in a large mass that is attached to vegetation. Eggs hatch after about four weeks, and tadpoles metamorphose in four to five months (Stebbins et. al, 2012). The nearest CNDDB occurrence of NRLF to the R-354 site (Occ # 192) is 0.7 miles northeast (CDFW, 2019a).

The nearest occurrence of NRLF to the R-519 site (Occ # 196) is 1.1 miles east (CDFW, 2019a). NRLF was observed in October 2018 and July 2019 during field surveys conducted for this project at the RT-102 project site. Both observations were of one adult NRLF in or near the small tributary to Ryan Creek under forest canopy north of the sinkhole location.

NRLF is unlikely to occur at the R-354 project site due to lack of breeding habitat (emergent vegetation) and suboptimal non-breeding habitat in the immediate vicinity of the project site. Habitat on the west side of Ryan Slough at the R-519 project site contains suitable nonbreeding habitat for NRLF and Ryan Slough in the vicinity of the project could provide breeding habitat when the salinity is low in the winter months when the NRLF lays eggs. Nonbreeding NRLF were observed at the RT-102 project site and the species is expected to occur year-round at this location. Project activities will occur during summer months outside the NRLF breeding season.

4.9.2.9 Western pond turtle (*Emys marmorata*) (WPT) is a California Species of Special Concern. The WPT occurs in open water habitats throughout much of California, although at much lower numbers and fewer localities than historical populations, especially in urban areas. WPT prefer slack or slow water habitats with dense strands of submergent or emergent vegetation for food and cover, and with abundant basking habitat. WPT are a semi-aquatic species inhabiting streams, marshes, ponds, and irrigation ditches within woodland, grassland, and open forest communities, but they require upland sites for nesting and over-wintering. Presence of nearby nesting sites and lack of exotic predators are also good habitat components (Bury, 1986).

The nearest occurrence of WPT to the R-354 site (Occ. # 1238) is located 2.9 miles to the east (CDFW, 2019a). The nearest occurrence of WPT to the R-519 and RT-102 sites (Occ. # 1364) is located 3.4 miles southwest of the R-354 site and 2.9 miles southwest of the RT-102 site (CDFW, 2019a).

Although this species has not been observed at the project sites suitable aquatic and upland habitat occurs at all three sites. The R-354 project site has limited basking habitat along Freshwater Slough and tidal fluctuations make the site less optimal. The R-519 and RT-102 sites both have suitable aquatic habitat with basking habitat at or near the project sites.

4.9.2.10 Bald eagle (*Haliaeetus leucocephalus*) has been federally delisted but is a California Endangered species. It is also a CDFW Fully Protected species, a U.S. Forest Service Sensitive species, and a Bird of Conservation Concern. The bald eagle is associated with permanent water sources including coastal ocean waters, lakes, reservoirs, and large free-flowing rivers with abundant fish and nearby old-growth trees or snags for perching, roosting, and nesting. It roosts communally in winter in dense, uneven-aged conifer stands with old-growth components in proximity to feeding areas. It is a permanent resident in northern California and an uncommon winter migrant in the south of the state. There are no documented nesting occurrences near the project sites; however, the species has been observed foraging over Arcata Bay (Sullivan, et al. 2009). No suitable nesting habitat occurs near the R-354 project site; however, suitable nest trees

occur near the R-519 and RT-102 project sites. Freshwater Slough, Ryan Slough, and Ryan Creek could offer suitable foraging habitat for bald eagles.

4.9.2.11 Northern spotted owl (*Strix occidentalis caurina*) is a federally Threatened species and is a California Threatened species. It is an uncommon, permanent resident of heavily forested areas, preferring old growth forest or mixed stands of old growth and mature trees with multi-storied, high canopy cover. Douglas-fir, mixed conifer, and coast redwood forest are most commonly used habitat types. It occurs in the Coast ranges from southwestern British Columbia south to San Francisco Bay. The nearest Northern spotted owl nesting territory is HUM0987, which is located 2.3 miles south of R-519 and 1.8 miles southeast of RT-102 (CDFW, 2019b). The nearest occurrences of Northern spotted owl reported in the CNDDDB is approximately 1.1 mile south-southeast of RT-102 and 1.5 miles south-southeast of R-519; however, these occurrences are from surveys conducted in 1981 and 1982 (CDFW, 2019b). Surveys conducted at the same location in 2003 failed to detect Northern spotted owl at this location (CDFW, 2019b). Surveys conducted between 2001 and 2003 at a location approximately 0.6-mile southeast of RT-102 also failed to detect Northern spotted owl. Additionally, seven established survey stations conducted surveys for northern spotted owl in similar fragmented habitat between the known nesting territories and the location of the pipeline maintenance project sites. A total of 38 surveys were conducted at these seven locations between 1999 and 2006 and failed to detect northern spotted owl (CDFW, 2019b).

R-354 does not have any suitable spotted owl habitat. The R-519 project site is located on Ryan Slough with willow riparian habitat cover. There is some fragmented forest land in the western portion of the site that provides poor quality habitat, that would not be suitable spotted owl nesting. The RT-102 project site is located at the edge of forested land adjacent to riparian and pastureland. Forested habitat at the RT-102 site is also fragmented due to development west, north, and east of the site. The forested habitat at RT-102 consists of a narrow strip (less than 1,000 feet wide) of fragmented forest land with the Redwood Acres Fairgrounds directly west of the site and rural residential and farmlands east of the site. Spotted owls may occur in the vicinity of RT-102 because of the proximity to dense forested lands to the south, where the HUM0987 nesting territory is located; however, the project site does not support suitable habitat for nesting or foraging spotted owls due to the exposure of the location and fragmented nature of forest habitat at the site.

4.9.2.12 Osprey (*Pandion haliaetus*) is on the CDWF Watch List and is a species. It occurs throughout California except in the deserts and Great Basin. It nests in large trees, snags, dead-topped trees, and on man-made structures in open forest in northern California from the Cascade Range to Marin County along the coast, and to the southern Sierra Nevada range. Nests are situated near ocean shores, bays, lakes, river, and large streams, which are required for foraging, primarily on fish. Osprey will also forage on mammals, birds, reptiles, and amphibians on occasion. It breeds from March to September. The nearest occurrence (Occ. #107) is a 1998 nesting occurrence located approximately 1.2 miles south of R-354, 0.4 miles south of R-519, and 650 feet east of RT-102.

Suitable nest trees occur in the region, particularly near the R-519 and RT-102 project sites. Freshwater Slough, Ryan Slough, and Ryan Creek could offer suitable foraging habitat for osprey.

4.9.2.13 Northern harrier (*Circus cyaneus*) is a California Species of Special Concern. The Northern Harrier inhabits meadows, grasslands, open rangelands, desert sinks, fresh and saltwater emergent wetlands; seldom found in wooded areas. It forages mostly on voles and other small mammals, birds, frogs, small reptiles, crustaceans, insects, and, rarely on fish. Breeding occurs between April and September, with peak nesting in June and July. Destruction of wetland habitat, native grassland, and wet meadows, and the burning and plowing of nesting areas during early stages of the breeding cycle, are major reasons for the decline of this species (Remsen, 1978). Northern harrier was observed foraging within open pastureland at the R-354 and R-519 project sites. Suitable foraging habitat is also present within pastureland east of the RT-102 but the species was not observed at this location during field surveys.

The nearest occurrence (Occ. # 58) of northern harrier is a 2017 occurrence at the mouth of Freshwater Slough on Humboldt Bay (CDFW, 2019a). Nesting habitat at the R-354 site is poor quality due to the extent of cattle grazing onsite. The R-519 contains suitable nesting habitat in the area surrounding the project site. Suitable nesting habitat occurs south and east of the RT-102 site in pastureland.

4.7.2.14 White-tailed kite (*Elanus leucurus*) is a California Fully Protected species. It is a small raptor with a total length of about 12 inches and is often identified from a distance by its hovering or “kiting” behavior while hunting. White-tailed kites predate mostly on voles and other diurnal mammals, but will occasionally prey on birds, insects, reptiles, and amphibians. It typically forages over open grasslands and emergent wetlands. White-tailed kites nest in dense foliage in treetops near grassy foothills, marshes, riparian woodland, savanna, and partially cleared fields. Preferred nesting trees include oak, willow, sycamores, or other tree stands. White-tailed kites range from western California and southwestern Oregon to southeastern Arizona, and along the Gulf Coast from Texas to Florida, and peninsular Florida (Wheeler and Clark, 1995). White-tailed kite was observed foraging southeast of the R-354 site; however, suitable nesting habitat does not occur near the project site. White-tailed kites were not observed at the R-519 and RT-102 project sites; however, both sites offer nesting habitat with adjacent forest habitat within 500 feet of the sites.

4.7.2.15 Cooper’s hawk (*Accipiter cooperii*) was formerly on the California Species of Special Concern; however, it was downgraded to the CDWF Watch List. This species typically breeds over much of California in forests, open woods, and streamside trees. They use additional habitats for hunting, including chaparral and other scrub communities. Cooper’s hawks have been known to occur in residential or rural residential areas, where they can feed on passerine birds at bird feeders.

Cooper’s hawk was not observed at any of the project sites. The species is not expected to occur at the R-354 project site due to the lack of suitable nesting habitat and poor quality foraging habitat. The R-519 and RT-102 sites offer suitable foraging habitat and potential nesting habitat within forested land adjacent to the project sites.

4.7.2.16 Sharp-shinned hawk (*Accipiter striatus*) is on the CDWF Watch List during nesting periods. This species typically builds nests within woodland habitat where they forage on small birds. Sharp-shinned hawks will also occasionally eat small mammals and insects. This species is a fairly common winter visitor and resident along coastal ridges foraging in woodland and semi-open habitats.

Sharp-shinned hawk was not observed at any of the project sites. The species is not expected to occur at the R-354 project site due to the lack of suitable nesting habitat and poor quality foraging habitat. The R-519 and RT-102 sites offer suitable foraging habitat and potential nesting habitat within forested land adjacent to the project sites.

4.7.2.17 Vaux's swift (*Chaetura vauxi*) is a California Species of Special Concern. Vaux's swift occurs as a breeding resident in the Sierra Nevada, Cascade, and Coastal ranges of California. This species nests in redwood and Douglas-fir forest in large hollow trees or snags. It does not typically winter in California. There are no documented occurrences of this species near the project sites in the CNDDDB (CDFW, 2019a).

Suitable nesting habitat does not occur near R-354 and R-519 project sites; however, this species could forage onsite. Vaux's swifts were observed soaring above the RT-102 project site. The individuals were not observed visiting a cavity (potential nest), but suitable nesting trees occur on and adjacent to the RT-102 project site.

4.7.2.18 Yellow warbler (*Setophaga petechia*) is a California Species of Special Concern and a Bird of Conservation Concern. This species is a common resident of riparian deciduous habitats of cottonwoods, willows, alders, and other small trees and shrubs typical of low, open-canopy riparian woodland. This bird gleans and hovers in upper canopy of deciduous trees and shrubs, feeding on insects and spiders. The breeding season for this species begins in mid-April and extends through early August with peak activity in June (Ficken and Ficken, 1966). This species has been frequently observed at the Freshwater Farms Reserve located approximately 1.5 miles east of the project sites (Sullivan, et al. 2009). Additionally, this species was observed at the RT-102 project site during the July 2019 survey.

Suitable nesting and foraging habitats occur at both the R-519 and RT-102 project sites; however, suitable habitat is not present at the R-354 project site.

4.7.2.19 Willow flycatcher (*Empidonax traillii*) is a California Endangered species, USFWS Bird of Conservation Concern, and a Forest Service Sensitive species. Willow flycatcher inhabit willow thickets, and brushy fields. It breeds in thickets of deciduous trees and shrubs, especially willows, or along woodland edges and often near streams or marshes. It forages from a perch where it captures insects in mid-air but will also capture insects by gleaning from leaves.

The nearest recorded occurrence of willow flycatcher (Occ # 116) is a 2004 occurrence located approximately 100 east of the project sites (CDFW, 2019a). There is no suitable habitat at the R-354 project site and the species is unlikely to nest at the R-519 and RT-102 project sites due to the discontinuous willow riparian habitat at these locations.

4.7.2.20 Black-capped chickadee (*Poecile atricapillus*) is on the CDWF Watch List. It is a species that is a year-round resident to the northern half of the United States and within California is a occurs within Del Norte, Humboldt, and Siskiyou counties. Within its range in California, the species mostly occurs within montane riparian habitat with alder, willow, and other deciduous riparian trees (Zeiner, et al., 1990). However, the species can nest in conifer trees adjacent to riparian habitat. Black-capped chickadees can excavate their own cavities within rotten snags or branches or can utilize old woodpecker cavities for nesting. Nesting cavities are typically within four and ten feet from the ground (Baicich and Harrison, 2008).

Black-capped chickadees occur year-round in the vicinity of the project site and could nest in suitable habitat near RT-102 and R-519. No cavities were observed within trees proposed for removal and the majority of trees were are too small to support cavities for nesting. 4.7.2.21 Olive-sided flycatcher (*Contopus cooperi*) is on the CDWF Watch List. Olive-sided Flycatcher breeds from western and central Alaska across central and southern Canada south into the United States in the Great Lakes region, and in northern New England. Breeding habitat for the Olive-sided Flycatcher is primarily late-successional conifer forests with open canopies. The species is highly associated with edges, openings, and natural and human-created clearings in otherwise relatively dense forests (Shuford and Gardali, 2008). Fire management and suppression and logging within their breeding habitat in California and possible destruction of forests within their central America winter territories could be responsible for the species decline (Marshall, 1988).

This species has been observed at the Freshwater Reserve and is expected to occur in the vicinity of the project site. The forest edge habitat at RT-102 and R-519 project sites could offer nesting sites for the species.

4.10 WILDLIFE CORRIDORS

Wildlife migration corridors are generally defined as connections between fragmented habitat patches that allow for physical and genetic exchange between otherwise isolated wildlife populations. Migration corridors may be local, such as those between foraging and nesting or denning areas, or they may be regional in extent. Migration corridors are not unidirectional access routes; however, reference is usually made to source and receiver areas in discussions of wildlife movement networks. "Habitat linkages" are migration corridors that contain contiguous strips of native vegetation between source and receiver areas. Habitat linkages provide cover and forage sufficient for temporary inhabitation by a variety of ground-dwelling animal species. Wildlife migration corridors are essential to the regional fitness of an area as they provide avenues of genetic exchange and allow animals to access alternative territories as fluctuating dispersal pressures dictate.

The R-354 and R-519 sites are both surrounded by development and pasture lands. The riparian corridor associated with Ryan Slough and Ryan Creek south of R-519 and adjacent to RT-102 provides wildlife habitat as well as a wildlife corridor linking remaining available habitat within the watershed.

5.0 REGULATORY SETTING

5.1 FEDERAL

5.1.1 Special-Status Species

The federal Endangered Species Act (FESA), administered by the USFWS and the National Marine Fisheries Service (NMFS) (collectively referred hereafter as the “Services”), provides protection to species listed as Threatened (FT) or Endangered (FE), or proposed for listing as Threatened (PFT) or Endangered (PFE). The Services maintain lists of species that are neither formally listed nor proposed but could be listed in the future. These federal candidate species (FC) include taxa for which substantial information on biological vulnerability and potential threats exists and are maintained in order to support the appropriateness of proposing to list the taxa as an endangered or threatened species.

Additionally, the FESA can protect a DPS of a species. The “Distinct Population Segment” is the smallest division of a taxonomic species that can be protected under the FESA. Three elements are considered in determining whether DPS is a factor as endangered or threatened under FESA. These elements are *discreteness* of the population segment in relation to the remainder of the species, the *significance* of the population segment to the species, and the population segments *conservation status* in relation to FESA’s standards for listing. If a DPS is determined to be discrete and significant, its evaluation for endangered or threatened status will be based on FESA’s definitions of those terms and a review of the factors included in section 4(a) of the FESA.

With respect to salmonid DPS, the NMFS has developed a policy that applies only to species of salmonids native to the Pacific. Under the policy, Pacific salmon is considered a DPS if it represents an evolutionarily significant unit (ESU) of a biological species (NOAA, 1996). A species must meet two criteria to be considered a separate ESU: it must be substantially reproductively isolated from other conspecific population units; and it must represent an important component in the evolutionary legacy of the species.

Projects that will result in the “take” of a federally listed or proposed species (as defined by FESA Section 9) are required to consult with the Services. The objective of consultation is to determine whether the project will jeopardize the continued existence of a listed or proposed species, and to determine what mitigation measures will be required to avoid jeopardy. Consultations are conducted under Sections 7 or 10 of FESA depending on the involvement by the federal government.

Under Section 7, the Services are authorized to issue Incidental Take Permits (ITP) for the take of a listed species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the federal agency. A Biological Assessment is usually required as part of the Section 7 consultation to provide sufficient information for the Services to fully determine the project’s potential effect on listed species. The Services must make one of three possible findings for each species potentially affected:

No effect: The proposed action will not affect the listed species or critical habitat;

Not likely to adversely affect: Effects of construction on the listed species are expected to be discountable (extremely unlikely to occur), insignificant (minimal impact without take), or beneficial; and

Likely to adversely affect: An adverse effect may occur as a direct or indirect result of the proposed action, and the effect is not discountable, insignificant, or beneficial.

Section 10 consultation is conducted when there is no federal involvement in a project except compliance with FESA.

The USFWS administers the federal Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-711) and the Bald Eagle and Golden Eagle Protection Act (16 USC 668-688). The MBTA prevents the removal of trees, shrubs, and other structures containing active nests of migratory bird species that may result in the loss of eggs or nestlings. Adherence to construction windows either before the initiation of breeding activities or after young birds have fledged is a typical step to protect migratory birds and comply with the MBTA. The Bald Eagle and Golden Eagle Protection Act prohibits the taking or possession of bald and golden eagles, their eggs, or their nests without a permit from the USFWS.

5.1.2 Waters and Wetlands

The U.S. Army Corps of Engineers (Corps) and the U.S. Environmental Protection Agency (EPA) regulate the discharge of dredge and fill material into jurisdictional “waters of the United States” (WoUS) and wetlands under Section 404 of the Clean Water Act.

The Corps is responsible for the issuance of permits for the placement of dredged or fill material into WoUS pursuant to Section 404 of the Clean Water Act (33 USC 1344). As defined by the Corps at 33 CFR 328.3(a)(3), WoUS are those waters that are 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; tributaries and impoundments to such waters; interstate waters including interstate wetlands; and, territorial seas.

The Corps asserts jurisdiction over traditional navigable waters (TNW) and adjacent wetlands. Under Corps and EPA regulations, wetlands are defined as: “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”

In non-tidal waters, the lateral extent of Corps jurisdiction is determined by the OHWM which is defined as the: “...line on the shore established by the fluctuations of water and indicated by physical characteristics such as 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.” (33 CFR 328[e]).

On June 29, 2015, the Corps and EPA issued new definitions for waters/wetlands (U.S. Army Corps of Engineers and U.S. Environmental Protection Agency, 2015), intended to become effective on August 28, 2015. These regulatory definitions are known as the 2015 Clean Water Rule.

Immediately subsequent to issuance, the 2015 Clean Water Rule (Rule) was challenged in federal courts, and in October 2015, the Sixth Circuit Court of Appeals put a nationwide hold on the new Rule, reverting to the 1986 regulations and subsequent guidance for Approved Jurisdictional Determinations. In 2017, the Corps and EPA published their intent to “review and rescind or revise” the 2015 Clean Water Rule, and the EPA asked the courts to suspend the case while the Rule was under review. In 2018 the EPA delayed the effective date of the 2015 Clean Water Rule for two years, and the Sixth Circuit Court lifted its stay of the Rule. A federal judge then issued a nationwide injunction on the administrative delay of the Clean Water Rule for failure to comply with the Administrative Procedure Act. Pursuant to the Court order, the 2015 Clean Water Rule remained in effect in 22 states, including California (U.S. Army Corps of Engineers, 2018).

On December 11, 2018 the Corps and EPA proposed a revised definition of waters of the U.S. This proposal was published in the Federal Register and entered a public review period that ended on April 15, 2019. On October 22, 2019, the EPA and Department of the Army published a final rule to repeal the 2015 Clean Water Rule reverting regulation back to the 1986 regulations and subsequent guidance for Approved Jurisdictional Determinations. The final rule became effective on December 23, 2019. On January 23, 2020, the Corps and EPA finalized the Navigable Waters Protection Rule to define Waters of the U.S. and streamline the definition so that it includes four categories of jurisdictional waters, provides clear exclusions for features not regulated, and defines terms in the regulatory text. The Navigable Waters Protection Rule fulfills Executive Order 13788 and will become effective 60 days after publication in the Federal Register. Once effective, it will replace the rule published on October 22, 2019.

5.2 STATE

5.2.1 Special-Status Species

The CDFW administers a number of laws and programs designed to protect the state’s fish and wildlife resources. Principal of these is the California Endangered Species Act of 1984 (CESA) (Fish and Game Code Section 2050), which regulates the listing and take of state endangered (SE) and threatened species (ST). Under Section 2081 of CESA, CDFW may authorize an incidental take permit allowing the otherwise unlawful take of a SE or ST species.

CDFW maintains lists of Candidate-Endangered species (SCE) and Candidate-Threatened species (SCT). These candidate species are afforded the same level of protection as listed species. CDFW designates Species of Special Concern (SSC) that are species of limited distribution, declining populations, diminishing habitat, or unusual scientific, recreational, or educational value. These species do not have the same legal protection as listed species but may be added to official lists in the future. The SSC list is intended by CDFW as a management tool for consideration in future land use decisions.

Other State laws also protect wildlife and plants. Section 3511 of the California Fish and Game Code (F&G Code), for example, designates species that are afforded “Fully Protected” (FP) status. F&G Code Sections 4700 and 5515 assign the same status to specified mammals and fish. These statutes generally provide that specifically identified

birds, mammals, and fish “or parts thereof may not be taken or possessed at any time and no provision of [the Fish and Game] code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected [bird, mammal, or fish] and no permits or licenses heretofore issued shall have any force or effect” for any such purpose. For fully protected fish and mammals, the only exception to the take prohibition is that the Fish and Game Commission may authorize the collecting of such species “for necessary scientific research” (F&G Code, Sections 4700, 5515). With a proper permit, fully protected species may also be captured live and relocated “for the protection of livestock” (Section 3511). Section 3503.5 protects birds-of-prey (Falconiformes and Strigiformes), their eggs, and their nests. That statute provides that, “[I]t is unlawful to take, possess, or destroy any birds in the orders 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 adopted pursuant thereto.”

CDFW manages the California Native Plant Protection Act (CNPPA) of 1977 (F&G Code Section 1900, et seq.), which was enacted to identify, designate and protect rare plants. In accordance with CDFW guidelines, all California Rare Plant Rank (CRPR) 1 (A and B), Rank 2 (A and B), Rank 3, and some Rank 4 plants are considered “rare” under the Act, and meet the definition of Rare or Endangered under the CEQA Guidelines §15125 and/or §15380. Potential impacts to these species are considered during CEQA review of a proposed project. The CNPPA allows landowners, under most circumstances involving new development, to take rare plant species, provided that the owners first notify CDFW and give the agency at least 10 days to come and retrieve (and presumably replant) the plants before they are plowed under or otherwise destroyed (F&G Code Section 1913 exempts from “take” prohibition “the removal of endangered or rare native plants from a canal, lateral ditch, building site, or road, or other right of way”).

5.2.2 Waters and Wetlands

The California Coastal Act of 1976 created the California Coastal Commission, which consists of six area offices that are responsible for granting development permits for coastal projects and for determining consistency between federal and state coastal management programs. Wetlands found in the coastal zone are regulated under the California Coastal Act and the Federal Coastal Zone Management Act (CZMA) and are under the jurisdiction of the CCC. The authority of the CCC includes reviewing proposed project actions, as well as reviewing project actions for the integration of policies that are established by the California Coastal Act. The legislature also created the California Coastal Conservancy (Coastal Conservancy) in 1976, which is authorized to take steps to preserve, enhance, and restore coastal resources, as well as to address issues that regulations alone are unable to resolve.

The CCC, under the California Coastal Act of 1976, defines a wetland as:

“... land within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens”. (Pub. Res. Code 30121)

Further guidance regarding the definition of coastal wetlands jurisdiction is provided by the California Code of Regulations, in which hydrologic factors, hydric soils and vegetation are used independently to define a wetland. Under these provisions, wetlands are defined as:

“...land where the water table is at near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentration of salts or other substances in the substrate. Such wetlands can be recognized by the presence of surface water or saturated substrate at some time during each year and their location within, or adjacent to vegetated wetland or deepwater habitats.” (14 CCR 13577)

Pursuant to the California Coastal Act of 1976, the California Coastal Commission (CCC) is responsible for implementing the California Coastal Management Program in California's Coastal Zone, which extends three miles seaward and generally about 1,000 yards inland. The CCC's primary mission is to plan for and regulate land and water uses in the coastal zone consistent with the Local Coastal Program, in this case the Humboldt Bay Area Plan (Humboldt County, 1983). Because the CCC has approved the Local Coastal Program, Humboldt County acting on behalf of the CCC issues its own permits for development within the coastal zone. The PG&E Pipeline Maintenance project sites are all located within the Coastal Zone.

Pursuant to Section 1602 of the Fish and Game Code, a Lake or Streambed Alteration Agreement (LSAA) between the CDFW and state or local governmental agency, public utility, or private citizen is required before the initiation of a construction project that will: (1) divert, obstruct, or change the natural flow or the bed, channel, or bank of a river, stream, or lake; (2) use materials from a streambed; or (3) result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake. Therefore, the CDFW claims jurisdiction over the bed, bank, and channel of drainage features with regard to activities regulated under Section 1602 of the California Fish and Game Code. The CDFW has adopted the same wetland definition as the USFWS, classified by the presence of only one parameter; however, CDFW does not specifically regulate wetlands.

The Porter-Cologne Water Quality Control Act (CA Water Code §§ 13000-13999.10) mandates that waters of the State of California shall be protected. Current policy in California is that activities that may affect waters of the State shall be regulated to attain the highest quality. Waters of the State include any surface water or groundwater, including saline waters, within the boundaries of the State. The Porter-Cologne Act establishes that the State assumes responsibility for implementing portions of the federal CWA, rather than operating separate State and Federal water pollution control programs in California. Consequently, the State is involved in activities such as setting water quality standards, issuing discharge permits, and operating grant programs. Pursuant to Section 401 of the Clean Water Act, the Corps cannot issue a federal permit until the State of California first issues a water quality certification to ensure that a project will comply with

state water quality standards. The authority to issue water quality certifications in the Project area is vested with the NCRWQCB.

In April 2019, the State Water Resources Control Board adopted the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material (Procedures), for inclusion in the Water Quality Control Plan for Inland Surface Waters and Enclosed Bays and Estuaries and Ocean Waters of California. The Procedures consist of four major elements: 1) a wetland definition; 2) wetland delineation procedures; 3) a wetland jurisdictional framework; and 4) procedures for the submittal, review and approval of applications for Water Quality Certifications and Waste Discharge Requirements for dredge or fill activities. The Procedures were recently approved by the Office of Administrative Law. The Procedures will be implemented and will apply to all applications for discharge of dredged or fill material to waters of the state nine months after final approval by the Office of Administrative Law. The Procedures will take effect in May 2020.

5.3 LOCAL AND REGIONAL PLANS

5.3.1 Humboldt County General Plan

The unincorporated lands of Humboldt County fall under the jurisdiction of the County. The Conservation and Open Space Elements of the Humboldt County General Plan contain goals and policies pertaining to biological resources of Humboldt County (Humboldt County, 2017). Goals and policies that are relevant to biological resources are included in this Section.

5.3.1.1 Goals

- BR-G1. Threatened and Endangered Species.** Sufficient recovery of threatened and endangered species to support de-listing.
- BR-G2. Sensitive and Critical Habitat.** A mapped inventory of sensitive and critical habitat where biological resource protection policies apply.
- BR-G3. Benefits of Biological Resources.** Fish and wildlife habitats protected on a sustainable basis to generate long-term public, economic, and environmental benefits.

5.3.1.2 Policies

- BR-P1. Compatible Land Uses.** Areas containing sensitive habitats shall be planned and zoned for uses compatible with the long-term sustainability of the habitat. Discretionary land uses and building activity in proximity to sensitive habitats shall be conditioned or otherwise permitted to prevent significant degradation of sensitive habitat, to the extent feasible consistent with California Department of Fish and Wildlife guidelines or recovery strategies.
- BR-P2. Critical Habitat.** Discretionary projects which use federal permits or federal funds on private lands that have the potential to impact critical habitat shall be conditioned to avoid significant habitat modification or

destruction consistent with federally adopted Habitat Recovery Plans or interim recovery strategies.

- BR-P4. Development within Stream Channels.** Development within stream channels shall be permitted when there is no lesser environmentally damaging feasible alternative, and where the best feasible mitigation measures have been provided to minimize adverse environmental effects. Development shall be limited to essential, non-disruptive projects as listed in Standard BR-S6 - Development within Stream Channels.
- BR-P5. Streamside Management Areas.** To protect sensitive fish and wildlife habitats and to minimize erosion, runoff, and interference with surface water flows, the County shall maintain Streamside Management Areas, along streams including intermittent streams that exhibit in-channel wetland characteristics and off-channel riparian vegetation.
- BR-P6. Development within Streamside Management Areas.** Development within Streamside Management Areas shall only be permitted where mitigation measures (Standards BR-S8 - Required Mitigation Measures, BR-S9 - Erosion Control, and BR-S10 - Development Standards for Wetlands) have been provided to minimize any adverse environmental effects, and shall be limited to uses as described in Standard BR-S7 - Development within Streamside Management Areas.
- BR-P7. Wetland Identification.** The presence of wetlands in the vicinity of a proposed project shall be determined during the review process for discretionary projects and for ministerial building and grading permit applications, when the proposed building development activity involves new construction or expansion of existing structures or grading activities. Wetland delineation by a qualified professional shall be required when wetland characterization and limits cannot be easily inventoried and identified by site inspection.
- BR-P8. Wetlands Banking.** The County supports the development of a wetlands banking system that minimizes potential conversion of prime agriculture lands to wetlands.
- BR-P9. Oak Woodlands.** Oak woodlands shall be conserved through the review and conditioning of discretionary projects to minimize avoidable impacts to functional capacity and aesthetics, consistent with state law.
- BR-P10. Invasive Plant Species.** The County shall cooperate with public and private efforts to manage and control noxious and exotic invasive plant species. The County shall recommend measures to minimize the introduction of noxious and exotic invasive plant species in landscaping, grading and major vegetation clearing activities.

- BR-P11. Biological Resource Maps.** Biological resource maps shall be consulted during the ministerial and discretionary permit review process in order to identify habitat concerns and to guide mitigation for discretionary projects that will reduce biological resource impacts to below levels of significance, consistent with CEQA.
- BR-P12. Agency Review.** The County shall request the California Department of Fish and Wildlife, as well as other appropriate trustee agencies and organizations, to review plans for development within Sensitive Habitat, including Streamside Management Areas. The County shall request NOAA Fisheries or U.S. Fish and Wildlife Service to review plans for development within critical habitat if the project includes federal permits or federal funding. Recommended mitigation measures to reduce impacts below levels of significance shall be considered during project approval, consistent with CEQA.
- BR-P13. Landmark Trees.** Establish a program to identify and protect landmark trees, including trees that exhibit notable characteristics in terms of their size, age, rarity, shape or location.

5.3.1.3 Standards

Sensitive and Critical Habitats

- BR-S1. Development Excluded from Sensitive Habitat Policies.** Proposed development occurring within areas containing sensitive habitats shall be subject to the conditions and requirements of this chapter except for these exclusions (which do not preempt other County regulations or those of other agencies):
- A. Timber management and harvest activities conducted under the California Forest Practice Act (Z'Berg-Nejedly) and Rules or activities exempt from local regulation as per California Public Resources Code 4516.5(d). These standards shall not be used to reduce buffers specified under the State Forest Practice Rules and mining activities pursuant to Surface Mining and Reclamation Act.
 - B. Any area proposed for development, which upon examination of the biological resource maps and field inspection is not actually within or does not contain the indicated habitat.
 - C. Agricultural practices which are principally permitted within the zone shall not be considered development for the purposes of this standard
- BR-S2. Agency Consultation.** For discretionary projects with potential to impact critical, or sensitive habitats, the County will seek specific recommendations from the appropriate agencies, as applicable to the specific project location, class of development, or natural resource involved.

- BR-S3. Critical Habitat Defined.** Critical habitats are habitats necessary for the protection of threatened or endangered species listed under the Federal Endangered Species Act. Designation, mapping and enforcement of critical habitat is the responsibility of federal agencies.
- BR-S4. Sensitive Habitat Defined.** Sensitive habitats are defined as a biologically unique, limited, or an especially valuable habitat type for a species whose habitat requirements, if significantly changed, would cause a threatening change to the species population across its range and may include the following:
- A. Habitat necessary for the protection of rare, threatened and endangered species as listed under the FESA or CESA
 - B. Migratory deer winter range
 - C. Roosevelt elk range
 - D. Sensitive avian species rookery and nest sites (e.g. osprey, great blue heron and egret)
 - E. Streams and streamside areas
 - F. Wetlands
 - G. Protected vascular plant communities as listed by the US Fish & Wildlife Service or the California Department of Fish and Wildlife.
 - H. Other sensitive habitats and communities as may be currently, correctly and accurately listed in the California Department of Fish and Wildlife's California Natural Diversity Data Base, as amended periodically.
- BR-S5. Streamside Management Areas Defined.** Streamside Management Areas (SMA) are identified and modified as follows:
- A. Areas specifically mapped as SMA and Wetland (WR) Combining Zones, subject to verification and adjustment pursuant to site-specific biological reporting and review procedures.
 - B. For areas along streams not specifically mapped as SMA and Wetland (WR) Combining Zones, the outer boundaries of the SMA shall be defined as:
 - 1. 100 feet, measured as the horizontal distance from the top of bank or edge of riparian drip-line whichever is greater on either side of perennial streams.
 - 2. 50 feet, measured as the horizontal distance from the top of bank or edge of riparian drip-line whichever is greater on either side of intermittent streams.
 - 3. The width of Streamside Management Areas shall not exceed 200 feet measured as a horizontal distance from the top of bank.
 - C. The width of Streamside Management Areas shall be expanded to up to

200 feet measured as a horizontal distance from the top of bank as necessary to include slides, or areas with visible evidence of slope instability.

- D. The Streamside Management Area may be reduced or eliminated where the County determines, based on specific factual findings, that the mapping of the SMA is not accurate, there are no in-channel wetland characteristics or off-channel riparian vegetation, the reduction will not significantly affect the biological resources of the SMA on the property. When the prescribed buffer would prohibit development of the site for the principal use for which it is designated, measures shall be applied that result in the least environmentally damaging feasible project.
- E. SMAs do not include watercourses consisting entirely of a man-made drainage ditch, or other man-made drainage device, construction, or system.

Stream Channels

BR-S6. Development within Stream Channels. Development within stream channels may be approved where consistent with Policy BR-P4, Development within Stream Channels, and is limited to the following projects.

- A. Fishery, wildlife, and aquaculture enhancement and restoration projects.
- B. Road crossings consistent with Standard BR-S9, Erosion Control, of this section.
- C. Flood control and drainage channels, levees, dikes, and floodgates.
- D. Mineral extraction consistent with other County regulations.
- E. Small-scale hydroelectric power plants in compliance with applicable County regulations and those of other agencies.
- F. Wells and spring boxes, and agricultural diversions.
- G. New fencing, so long as it would not impede the natural drainage or wildlife movement and would not adversely affect the stream environment or wildlife movement.
- H. Bank protection provided it is the least environmentally damaging alternative.
- I. Other essential projects, including municipal groundwater pumping stations, provided they are the least environmentally damaging alternative, or necessary for the protection of the public's health and safety.

Streamside Management Areas

BR-S7. Development within Streamside Management Areas. Development within Streamside Management Areas may be approved where

consistent with Policy BR-P6, Development within Streamside Management Areas, and shall be limited to the following uses:

- A. Development permitted within stream channels per BR-S6, Development within Stream Channels.
- B. Timber management and harvest activities under a timber harvesting plan or non-industrial timber management plan, or activities exempt from local regulation as per California Public Resources Code 4516.5(d).
- C. Road, bridge, and trail replacement or construction, when it can be demonstrated that it would not degrade fish and wildlife resources or water quality, and that vegetative clearing is kept to a minimum.
- D. Removal of vegetation for disease control or public safety purposes.
- E. Normal, usual and historical agricultural practices and uses which are principally permitted within the SMA shall not be considered development for the purposes of this standard.
- F. Normal, usual and historical agricultural and surface mining practices and uses which are principally permitted within the SMA shall not be considered development for the purposes of this standard.

BR-S8. Required Mitigation Measures. Mitigation measures for development within Streamside Management Areas shall, at a minimum, include:

- A. Retaining snags unless felling is required by CAL-OSHA, by CAL FIRE forest and fire protection regulations or for public health and safety reasons. The felling must be approved by the Planning Director. Felled snags shall be left on the ground if consistent with fire protection regulations and the required treatment of slash or fuels.
- B. Retain live trees with visible evidence of current or historical use as nesting sites by hawks, owls, eagles, osprey, herons, kites or egrets.
- C. Erosion control measures (as per Standard BR-S9- Erosion Control).
- D. Maximum feasible retention of overstory canopy in riparian corridors.

BR-S9. Erosion Control. Erosion control measures for development within Streamside Management Areas shall include the following:

- A. During construction, land clearing and vegetation removal will be minimized, following the provisions of the Water Resources Element and the standards listed here.
- B. Consistent with BR-S8, construction sites with at least 100 square feet of exposed soil will be planted or seeded as appropriate per mitigations as recommended in writing by the lead agency with native or non-invasive vegetation and mulched with natural or chemical stabilizers to aid in erosion control and ensure revegetation.
- C. Long slopes will be minimized to increase infiltration and reduce water velocities down cut slopes by such techniques as soil roughing, serrated cuts, selective grading, shaping, benching, and berm construction.

- D. Concentrated runoff will be controlled by the construction and continued maintenance of culverts, conduits, non-erodible channels, diversion dikes, interceptor ditches, slope drains, or appropriate mechanisms. Concentrated runoff will be carried to the nearest drainage course. Energy dissipaters may be installed to prevent erosion at the point of discharge, where discharge is to natural ground or channels.
- E. Runoff shall be controlled to prevent erosion by on-site or off-site methods. On-site methods include, but are not limited to, the use of infiltration basins, percolation pits, or trenches. On-site methods are not suitable where high groundwater or slope stability problems would inhibit or be aggravated by on-site retention or where retention will provide no benefits for groundwater recharge or erosion control. Off-site methods include detention or dispersal of runoff over non-erodible vegetated surfaces where it would not contribute to downstream erosion or flooding.
- F. Disposal of silt, organic, and earthen material from sediment basins and excess material from construction will be disposed of out of the Streamside Management Area to comply with California Department of Fish and Wildlife and the North Coast Regional Water Quality Control Board requirements.
- G. Winter operations (generally October 15 thru April 15) shall employ the following special considerations:
 - 1. Slopes will be temporarily stabilized by stage seeding and/or planting of fast germinating seeds, such as barley or rye grass, and mulched with protective coverings such as natural or chemical stabilizations, and
 - 2. Runoff from the site will be temporarily detained or filtered by berms, vegetated filter strips, and/or catch basins to prevent the escape of sediment from the site. Drainage controls are to be maintained as long as necessary to prevent erosion throughout construction.

Wetlands and Other Wet Areas

BR-S10. Development Standards for Wetlands. Development standards for wetlands shall be consistent with the standards for Streamside Management Areas, as applicable except that the widths of the SMA for wetlands are as follows:

seasonal wetlands = 50 ft.

perennial wetlands = 150 ft.

and the setback begins at the edge of the delineated wetland. Buffers may be reduced based on site specific information and consultation with the California Department of Fish and Wildlife. No buffer shall be required for man-made wetlands except wetlands created for mitigation purposes.

BR-S11. Wetlands Defined. The County shall follow the US Army Corps of Engineers Wetland Delineation manual in the identification and classification of wetlands which considers wetlands as those 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.

Other Sensitive and Critical Habitats

Oak Woodlands

BR-S12. Discretionary Review within Oak Woodlands. Discretionary projects which may result in a significant effect on oak woodlands shall evaluate and mitigate any impacts, consistent with the provisions of CEQA, specifically Public Resources Code Section 21083.4.

Invasive Plant Species

BR-S13. Principally Permitted Accessory Use. Invasive plant species management and control measures shall be considered a principally permitted accessory use in all zones, except in the Coastal Zone.

5.3.1.4 Implementation Measures

BR-IM1. Biological Resource Maps. The County shall maintain the best available data in the form of GIS maps for the location and extent of wetlands, critical habitats, streamside management areas, Habitat Conservation Plan Areas, rookeries, and ranges of species identified in the California Natural Diversity Database.

BR-IM2. State and Federal Agency Permitting Coordination. The County shall maintain efficient and timely procedures for project referral to state and federal agencies for biological review and consultation.

BR-IM3. Biological Review and Referral. Building and Planning Division staff shall receive periodic training, and be encouraged to receive certification, related to the field identification of biological resources and mitigation of impacts.

BR-IM4. Wetlands Bank. The County shall assist in the development of a wetlands bank that minimizes potential conversion of prime agriculture lands to wetlands.

BR-IM5. Oak Woodlands Conservation Program. The County shall maintain an Oak Woodland Management Plan and attain eligibility for Oak Woodland Preservation Program funding (Fish and Game Code, Section 1360, Division 2, Chapter 4) to conserve and protect high-value oak woodlands.

BR-IM6. Modifications to the Streamside Management Area Ordinance. The County shall modify the SMA Ordinance for consistency with BR-S5 and to allow reductions to SMA widths through ministerial review in consultation with California Department of Fish and Wildlife. The SMA Ordinance shall provide exemptions for minor additions of up to 500 square feet aggregate for buildings or structures existing on April 25, 1995.

6.0 SIGNIFICANCE CRITERIA

The impact of the project on biological resources was evaluated in terms of mandatory findings of significance at Section 15065 of CEQA and Appendix G of the State CEQA Guidelines (Governor's Office of Planning and Research, 2018). The various components of the project were considered in association with site conditions and were evaluated against CEQA criteria and County General Plan policies pertaining to biological issues. In accordance with these CEQA Guidelines, a project will normally result in a significant impact if any of the following conditions would result from project implementation:

- 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 CDFW, USFWS, or NMFS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulation, or by the CDFW, USFWS, or NMFS;
- Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- 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 site;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; and,
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Additionally, the CEQA Guidelines Initial Study Land Use and Planning checklist notes that conflicts with applicable land use plans, policies, or regulations of an agency with jurisdiction over the project should be considered during a project's environmental review.

7.0 PROJECT IMPACT ANALYSIS

Effects on biological resources at the PG&E Pipeline Maintenance project sites will primarily be temporary with the exception of 0.07-acres of permanent impact associated with the installation of bank stabilization mats at R-354 on Freshwater Slough and 0.01-acre of permanent impact associated with installation of riprap at the culvert outfall location on RT-102. There will be a temporary loss of potential fish and wildlife habitat at all three project sites during construction. A turbidity curtain may be installed around the in-water work area at each of the pipeline maintenance sites to reduce the impact of increased turbidity associated with construction to surrounding aquatic habitat. Turbidity curtains will be deployed if determined to be necessary based on site specific conditions and turbidity levels recorded during in-water work. The use of turbidity curtains, if determined to be necessary, will temporarily exclude fish (if present) from aquatic habitat at the project sites but will be installed at low tide from the shoreline moving outward to minimize the potential for fish to occur within the aquatic work site. General construction will temporarily alter the natural movement and behavior of wildlife in the area of the projects. Construction may also result in indirect impacts that affect the quality of habitat on the project site and in the project area. Potential indirect impacts include invasion of non-native plants into natural areas, noise disturbances, and temporary declines in air and water quality during construction.

7.1 IMPACT CATEGORIES

Short-term and long-term impacts are analyzed for the proposed maintenance projects. Each impact statement is classified as to the level of significance, based on the significance thresholds from Section 6.0, and the availability of measures to feasibly mitigate project effects. Impact categories include:

- **Significant Unavoidable Impact** is an adverse effect that cannot be mitigated. This category of impact is one for which a solution has not been formulated, either because of the limits of technical and/or scientific knowledge, or unfeasibility from a technical, economic, and/or political perspective. Under CEQA, a Significant Unavoidable impact would require a “finding of overriding consideration” by the Lead Agency to approve the project;
- **Significant Mitigable Impact** is an adverse environmental effect that can be mitigated to less than significant levels. Measures have been identified that can feasibly be implemented and will avoid the impact altogether by not taking a certain action or parts of an action; minimize impacts by limiting the degree or magnitude of the action and its implementation; rectify the impact by repairing, rehabilitating, or restoring the affected environment; or compensate for the impact by replacing or providing substitute resources or environments;
- **Less than Significant Impact** is an adverse environmental effect that is less than significant or has no identified impact. These impacts, while adverse, are not of a sufficient magnitude, intensity, or duration to disrupt the environment, and have no serious consequences. As a result, no mitigation is required; and

- **Beneficial Impacts** is an environment effect of the project that benefits or improves the environment and no mitigation is required.

7.2 IMPACTS TO BIOLOGICAL RESOURCES

Effects on biological resources include primarily temporary impacts associated with pipeline excavation for maintenance or removal and repair of erosion at the sinkhole location. The installation of bank stabilization mats on the levee at the R-354 site on Freshwater Slough and the installation of riprap at the culvert intake and outfall locations at the RT-102 site will result in permanent impacts. The permeant impacts associated with the above project elements are relatively small footprint and potentially beneficial to aquatic habitat at the project sites. Bank Stabilization mats and the culvert replacement and repair of the sinkholes will improve aquatic habitat through elimination of ongoing erosion at these locations. Reduced erosion will result in reduced turbidity in adjacent aquatic habitat and improvements to water quality. Temporary impacts associated with the Project include habitat disturbance, introduction of barriers altering movement, localized turbidity, and tree removal. Indirect impacts include invasion of non-native plants into natural areas, noise disturbances, and temporary declines in air and water quality. The following analysis provides an assessment of potential impacts from the proposed project components.

IMPACT BIO-1: Construction of the pipeline maintenance projects will result in impacts to special-status plant species.

DISCUSSION: Special-status plant surveys conducted for the PG&E Pipeline Maintenance Projects identified special-status plant species within the defined study area at each of the project sites. All plant species observed during project-specific special-status plant surveys were California Rare Plant Rank (CRPR) species. No state or federal listed species were observed.

The installation of shoreline mats on the levee at the R-354 site will impact two special-status plant species: the sea watch and northern sand spurrey. The sea watch is a CRPR 4.2 species and the northern sand spurrey is a CRPR 2B.1 species. Special-status plant surveys conducted in 2019 identified a few individuals of the sea watch and approximately 40 individuals of the northern sand spurrey within the area proposed for shoreline mat installation for the purposes of bank stabilization on the levee north of Freshwater Slough.

Special-status plant surveys conducted in 2018 at the R-519 site on Ryan Slough identified Lyngbye's sedge, a CRPR 2B.2 species, along the lower banks or within the active channel all along Ryan Slough throughout the Project Study Area. Temporary disturbance to the bed and bank of Ryan Slough associated with removal of the exposed pipeline will impact individuals of Lyngbye's sedge.

Special-status plant surveys conducted in 2018 at the RT-102 site on Ryan Creek identified occurrences of Lynbye's sedge upstream of the sinkhole location and project disturbance footprint. Surveys did not identify any special-status plant species within the temporary disturbance footprint for the RT-102 site; therefore, project related impacts to special-status plant species are unlikely at this location.

Impacts to special-status plant species ranked CRPR 2B are considered potentially significant impacts. Impacts to special-status species ranked CRPR 4 species (sea-watch) are considered less than significant because they do not meet the CEQA definition of rare or endangered (see Section 15380 of the State CEQA Guidelines). In any case, only a small number of individuals would be affected and there are a large number of populations occurring nearby.

IMPACT CATEGORY: Potentially Significant Impact with Mitigation Required.

RECOMMENDED MITIGATION MEASURE – BIO-1: The following recommended mitigation measures would reduce project impacts to special-status plants at the pipeline maintenance project sites to less than significant.

- a. Permanent impact to northern sand spurrey plants at the R-354 site shall be mitigated through replacement on a 1:1 basis within suitable habitat adjacent to the permanent impact area (e.g. location on the levee outside of the shoreline mat placement footprint if approved by landowner) or at an alternate mitigation site near the project site as determined to be suitable by a qualified botanist. A Site Restoration Plan shall be prepared that provides for plant salvage and transplantation and/or seed collection and replanting, as appropriate and establish performance criteria and monitoring to ensure restoration to pre-project conditions.
- b. If a suitable replacement location for northern sand spurrey plants cannot be identified, collected seed could be provided to a seed bank for long-term storage.
- c. Temporary impact to Lyngbye's sedge at the R-519 site shall be restored upon project completion to pre-existing condition. A Site Restoration Plan shall be prepared that provides for plant salvage and transplantation and/or seed collection and replanting, as appropriate and establish performance criteria and monitoring to ensure restoration to pre-project conditions.

IMPACT BIO-2: In-water work at the pipeline maintenance project sites could impact special-status fish species if present at the project sites during construction. Construction will temporarily increase turbidity to the aquatic environment surrounding the project. Increases in turbidity can result in physical effects that adversely affect habitat and temporary suspension of sediments, organic matter, or contaminated constituents contained within the sediments could be introduced into the water column. Large-scale increases of organic matter within a water column, usually associated with fine sediments, such as silts and clays, can increase dissolved nutrient concentrations, resulting in increased algal blooms or decrease dissolved oxygen when the suspended sediments are anoxic or have a high chemical oxygen demand. Construction activities involving in-water work that will result in localized increases in turbidity include the removal of the exposed pipeline at the R-354 and R-519 sites. The use of a turbidity curtain, if determined to be necessary, may be deployed at the three work sites to minimize the effects of increased turbidity to surrounding areas.

In-water work and the installation of the turbidity curtain, if determined to be necessary, and could temporarily impede fish movement in the area and eliminate fish use of the construction sites. Pipeline removal and the potential use of a turbidity curtain at the R-354 site involves only the northern bank of Freshwater Slough; therefore, fish passage will not be restricted at the project site. Pipeline removal at the R-519 site involves removal of exposed pipeline from the entire Ryan Slough crossing. The potential use of a turbidity curtain during pipeline crossing removal would restrict fish passage through Ryan Slough; however, in-water work associated with the pipeline crossing removal is expected to take one day and would involve limited obstruction of the waterway if a turbidity curtain is used. Work on the bank of Ryan Creek at the RT-102 site only involves the west bank of the creek; therefore, fish passage will not be restricted at this location if the use of a turbidity curtain is determined to be necessary.

APPLICANT PROPOSED AVOIDANCE AND MINIMIZATION MEASURE (AMM):
The applicant has proposed the following Avoidance and Minimization Measures to reduce the potential for impact to special-status fish species and has incorporated them into the project design:

- a. An environmental training program will be developed and presented by a qualified biologist. All contractors and employees involved with the Project will be required to attend the training program. At a minimum the program will cover special-status species that could occur on the sites, their distribution, identification characteristics, sensitivity to human activities, legal protection, penalties for violation of state and federal laws, reporting requirements, and required Project avoidance, minimization, and mitigation measures.
- b. Construction activities in surface water or on the banks of Freshwater Slough, Ryan Slough, and Ryan Creek will be conducted within the agency approved aquatic work windows for minimization of impacts to listed fish species (July 1 to October 15).
- c. Based on guidance received from resource agency fish specialists in pre-application meetings, the in-water work in Freshwater Slough (R-354 site) and Ryan Slough (R-519 site) will be prioritized for occurrence in August and September, when water temperature is high, dissolved oxygen is low and aquatic conditions are least favorable for salmonid occurrence. This coincides with the timeframe when the aquatic work area is least likely to support listed fish species.
- d. Turbidity curtains, if determined to be necessary, will be installed around the in-water work area prior to any work in surface waters. Turbidity curtains, if deployed, will be installed at low tide when water levels are at their lowest to avoid entrapment of fish.
- e. To the extent feasible, construction activities (pipeline removal activities and riprap placement) that could cause increases in turbidity will be scheduled during low tide events.

- f. A Turbidity Monitoring Plan will be implemented during all in-water work to ensure that turbidity levels upstream and downstream of the project site is compliant with regulatory requirements.
- g. A qualified biological monitor will be present to monitor project activities during all in-water work and initial ground disturbance that has the potential to impact special-status species. If turbidity curtains are determined to be necessary, the biological monitor will ensure they are installed during low tide conditions to exclude fish from the in-water work area. If special-status fish species are observed in the work area during installation of the turbidity curtain, the fish will be allowed to leave of their own volition prior to installation of the turbidity curtain.

IMPACT CATEGORY: Less than Significant with implementation of Avoidance and Minimization Measures.

IMPACT BIO-3: Construction activities at the R-519 or RT-102 project sites could potentially impact aquatic special-status species such as WPT and NRLF.

DISCUSSION: Based on the review of pertinent literature, the proximity to known occurrences, and site surveys, WPT have a moderate potential to occur within Ryan Slough at the R-519 project site or within Ryan Creek at the RT-102 project site. There are occurrences of both WPT and NRLF within five miles of the project sites, and suitable aquatic habitat occurs onsite. Additionally, NRLF were observed during two separate survey events at the RT-102 project site.

APPLICANT PROPOSED AMM: The applicant has proposed the following Avoidance and Minimization Measures to reduce the potential for impact to special-status species, specifically WPT and NRLF to reduce project impact to less than significant levels:

Western Pond Turtle Measures Required for R-519 and RT-102 Project sites

- a. Because of the ability of WPT to disperse and lay eggs in the upland areas as far as 1,300 feet from inhabited water bodies, a qualified biologist will conduct preconstruction surveys for turtles and their nests 48 hours prior to ground disturbance. If nests are located, the nest site plus a 50-foot buffer around the nest site will be fenced to avoid impacts to the eggs or hatchlings. Construction at the nest site and within the buffer area will be delayed until the young leave the nest (this could be a period of many months) or as otherwise advised and directed by CDFW, the agency responsible for overseeing the protection of the pond turtle.
- b. Prior to ground disturbance activities, a barrier, such as wildlife exclusion fencing, will be placed around the excavation area to prevent WPT from moving into work areas.
- c. A qualified biological monitor will be present to monitor project activities during all in-water work and initial ground disturbance that has the potential to impact special-status species. If WPT is observed within the work area during construction, the biologist will relocate WPTs the shortest distance possible to

a location that contains suitable habitat and will not be affected by activities.

Northern Red Legged Frog Measures Required for R-519 and RT-102 Project sites

- d. Wetted channel segments, areas of riparian scrub, and other Environmentally Sensitive Areas near the project site, but outside the construction impact area, will be staked and flagged to avoid encroachment by equipment and construction crews. Environmentally Sensitive Areas within the construction impact area that can be avoided by equipment and crews will also be staked and flagged to minimize effects of construction.
- e. Prior to ground disturbance activities, a barrier, such as wildlife exclusion fencing, will be placed around the excavation area to prevent NRLF from moving into work areas.
- f. A NRLF survey of the project site 48 hours prior to ground disturbance. If any life stage of the NRLF is found, and these individuals are likely to be killed or injured by work activities, a qualified biologist will relocate NRLF the shortest distance possible to a location that contains suitable habitat and will not be affected by activities associated with the proposed project.
- g. A qualified biological monitor will be present to monitor project activities during all in-water work and initial ground disturbance that has the potential to impact special-status species. If NRLF is observed within the work area during construction, the biologist will relocate NRLFs the shortest distance possible to a location that contains suitable habitat and will not be affected by activities.
- h. During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.
- i. All refueling, maintenance, and staging of equipment and vehicles will occur at least 60 feet from riparian habitat or water bodies and not in a location from where a spill would drain directly toward aquatic habitat. Prior to the onset of work, PG&E will ensure that the construction contractor has a plan in place for prompt and effective response to any accidental spills. All workers will be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.
- j. The number of access routes, size of staging areas, and the total area of the activity will be limited to the minimum necessary to achieve the project goal. Environmentally Sensitive Areas will be established to confine access routes and construction areas to the minimum area necessary to complete construction and minimize the impact to NRLF habitat; this goal includes locating access routes and construction areas outside of wetlands and riparian areas to the maximum extent practicable.
- k. Tightly woven fiber netting or similar material will be used for erosion control or other purposes at the project site to ensure that the NRLF do not get trapped. Coconut coir matting is an acceptable erosion control material. No plastic mono-filament matting will be used for erosion control.

- l. If bullfrogs, non-native fish, or non-native crawfish are observed during construction, they shall, to the extent practicable, be humanely dispatched by a qualified biologist.
- m. To ensure that diseases are not conveyed between work sites by the biologists, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force will be followed at all times.

IMPACT CATEGORY: Less than Significant with implementation of AMMs.

IMPACT BIO-4. Tree removal or ground-clearing activities could impact raptors or other special-status bird species such as northern harrier, white-tailed kite, bald eagle, osprey, northern spotted owl, or Vaux's swift.

DISCUSSION: Many raptors and other special-status bird species are known to occur in proximity to the Project sites. Very limited tree cover occurs at the R-354 Site, but the R-519 and RT-102 Sites are at the edge of forested habitat and also support some riparian habitat. Trees removal will be required to access the R-519 and RT-102 Sites. The tree cover at the R-519 and RT-102 Sites does not provide suitable nesting habitat for northern spotted owl due to habitat fragmentation, and many surveys conducted for northern spotted owl near the site have failed to detect owls. The R-519 and RT-102 sites do provide potentially suitable nesting habitat for northern harrier, white-tailed kite, bald eagle, osprey, and Vaux's swift. In addition, pastureland and aquatic areas at the Project sites provide suitable foraging habitat for these species. The Projects are proposed to begin late in the season for compliance with in-water work windows established to protect fish species (July – September) and therefore, will be occurring toward the end of the nesting season.

All impacts to pastureland and aquatic habitat are temporary and will constitute a temporary impact to foraging habitat for special-status bird species. Due to the short-term and temporary nature of impacts conducted late in the nesting season (July - September), the temporary disturbance to foraging habitat is considered less than significant.

Tree removal or construction activities could potentially disrupt nesting occurrences of special-status species. Disturbance that causes nest abandonment and/or loss of reproductive effort could be considered a "take" and is considered a potentially significant impact.

APPLICANT PROPOSED AMM: The applicant has proposed the following Avoidance and Minimization Measures to reduce the potential for impact to raptors and other special-status bird species to reduce project impact to less than significant levels:

- a. Schedule vegetation removal and ground-clearing activities prior to the initiation of nesting activity (March) or after fledging (August).
- b. If Measure BIO-4(a) is infeasible, conduct pre-construction surveys between March 1 and August 15 in potential nesting habitat to identify nest sites. If an active raptor nest is observed within 350 feet of the project site, contact CDFW

for guidance and/or establish a 350-foot buffer around the nest tree. If a special-status passerine bird nest is observed during surveys, a 100-foot buffer around the nest will be established. If needed, consultation with CDFW should be conducted to determine whether reduced buffer zones are appropriate based on nesting phenology, site conditions, and recommendation(s) of a biological monitor. All construction activities shall be prohibited in the established buffer zones until the young have fledged.

IMPACT CATEGORY: Less than Significant with implementation of AMMs.

IMPACT BIO-5. Tree removal or ground-clearing activities could impact bird species protected under the Migratory Bird Treaty Act (MBTA).

DISCUSSION: There are trees present at all three projects sites that could provide nesting habitat for bird species protected by the MBTA. There is suitable nesting habitat associated with riparian habitat at the R-519 and RT-102 project sites. Tree removal or ground-clearing activities could potentially impact nesting birds that are protected under the federal MBTA of 1918 (16 USC 703-711) and Fish and Game codes (Sections 3503, 3503.5, and 3800). The laws and regulations prohibit the take, possession, or destruction of birds, their nests, or eggs. Disturbance that causes nest abandonment and/or loss of reproductive effort could be considered a "take".

APPLICANT PROPOSED AMM: The applicant has proposed the following Avoidance and Minimization Measures to reduce the potential for impact to MBTA protected breeding birds to reduce project impact to less than significant levels:

- a. Schedule vegetation removal and ground-clearing activities prior to the initiation of nesting activity (March) or after fledging (August).
- b. If Measure BIO-5(a) is infeasible, conduct pre-construction surveys between March 1 and August 15 in potential nesting habitat to identify nest sites. If a nest of a passerine bird species protected by the MBTA is observed during surveys, a 100-foot buffer around the nest will be established. Alternatively, consultation with CDFW should be conducted to determine whether reduced buffer zones are appropriate based on nesting phenology, site conditions, and recommendation(s) of a biological monitor. All construction activities shall be prohibited in the established buffer zone until the young have fledged.

IMPACT CATEGORY: Less than Significant with implementation of AMMs.

IMPACT BIO-6: The project will result in temporary and permanent impacts to aquatic resources (waters of the U.S. and wetlands) regulated by the Corps under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. The project will also result in temporary and permanent impacts to aquatic resources regulated by the California Coastal Commission under the California Coastal Act, the North Coast RWQCB under Section 401 of the Clean Water Act, and CDFW under Section 1600 of the California Fish and Game Code.

DISCUSSION: Preliminary Aquatic Resource Delineations have been conducted at each of the three pipeline maintenance project sites to determine the geographic

extent of federal and state regulatory jurisdiction (Padre, 2019a; Padre 2019b; Stantec, 2017). A total of 0.05-acre of permanent impact to waters and wetlands will occur as a result of the installation of shoreline mats on the levee at the R-354 site. Additionally, a total of 0.01-acre of permanent impact to waters and wetlands will occur as a result of the installation of riprap at the culvert intake and outfall at the RT-102 site. All other impacts to federal and state aquatic resources will be temporary disturbance associated with excavation and removal of exposed pipelines and erosion repair of the sinkholes. Table 4 outlines permanent and temporary impacts to federal aquatic resources and Table 5 outlines permanent and temporary impacts to aquatic resources under state jurisdiction.

Table 4. Summary of Impacts to Federal Jurisdictional Aquatic Resources

Table 4. Summary of Impacts to Federal Jurisdictional Aquatic Resources							
Wetland ID	Wetland Type	Permanent		Temporary		Total	
		Area (ft²)	Acreage	Area (ft²)	Acreage	Area (ft²)	Acreage
R-354 Pipeline Decommissioning/Removal and Levee Erosion Repair – Freshwater Slough Crossing							
W1	Wet Meadow	886.52	0.02	5,450.08	0.13	6,336.60	0.15
W3	Wet Meadow	--	--	172.43	0.00	172.43	0.00
W5	Wet Meadow	--	--	3,060.99	0.07	3,060.99	0.07
Freshwater Slough	Tidal Waters	1,348.47	0.03	1,231.44	0.03	2,579.91	0.06
Channel 1	Intermittent Channel	--	--	120.00	0.003	120.00	0.003
Subtotal R-354 Impacts to Federal Jurisdiction		2,234.99	0.05	10,034.94	0.23	12,149.93	0.28
R-519 Pipeline Replacement – Ryan Slough Crossing							
W01	Perennial Emergent Wetland	--	--	1,768.28	0.04	1,768.28	0.04
W11	Willow Riparian Shrub	--	--	5.15	0.0001	5.15	0.0001
W12	Willow Riparian Shrub	--	--	868.76	0.02	868.76	0.02
W15	Wet Meadow	--	--	29,683.40	0.68	29,683.40	0.68
W17	Perennial Emergent Wetland	--	--	813.02	0.02	813.02	0.02
Ryan Slough	Perennial Channel	--	--	1,573.91	0.04	1,573.91	0.04
Subtotal R-519 Impacts to Federal Jurisdiction		--	--	34,712.53	0.80	34,712.53	0.80
RT-102 Pipeline Remediation and Culvert Replacement – Ryan Creek							
W1	Forested Wetland	369.53	0.008	1591.42	0.04	1,960.95	0.048
W2	Wet Meadow	--	--	865.14	0.02	865.14	0.02

Table 4. Summary of Impacts to Federal Jurisdictional Aquatic Resources

Wetland ID	Wetland Type	Permanent		Temporary		Total	
		Area (ft ²)	Acreage	Area (ft ²)	Acreage	Area (ft ²)	Acreage
W3	Scrub Shrub Wetland	--	--	12,310.23	0.28	12,310.23	0.28
W4	Wet Meadow	--	--	2,125.95	0.05	2,125.95	0.05
Ryan Creek	Perennial Channel	7.88	0.0002	755.20	0.02	763.08	0.020
Channel 1	Intermittent Channel	125.00	0.003	--	--	125.00	0.003
Subtotal RT-102 Impacts to Federal Jurisdiction		502.41	0.01	17,647.94	0.41	18,150.35	0.42
PG&E Pipeline Maintenance Project Total Impact to Federal Jurisdiction		2,737.40	0.06	62,395.41	1.44	65,012.78	1.5

Table 5. Summary of Impacts to State Jurisdictional Aquatic Resources

State Agency	Permanent		Temporary		Total	
	Area (ft ²)	Acreage	Area (ft ²)	Acreage	Area (ft ²)	Acreage
R-354 Pipeline Decommissioning/Removal and Levee Erosion Repair – Freshwater Slough Crossing						
State Defined Wetland (California Coastal Commission)	3,000.02	0.07	61,002.91	1.40	64,002.93	1.47
Waters of the State (RWQCB)	2,234.99	0.05	9,914.94	0.23	12,149.93	0.28
Section 1600 Stream Feature (CDFW)	3,000.02	0.07	1,888.66	0.04	4,888.68	0.11
R-519 Pipeline Replacement – Ryan Slough Crossing						
State Defined Wetland (California Coastal Commission)	--	--	34,736.53	0.80	34,736.53	0.80
Waters of the State (RWQCB)	--	--	34,712.55	0.80	34,712.55	0.80
Section 1600 Stream Feature (CDFW)	--	--	2,673.52	0.06	2,673.52	0.06
RT-102 Pipeline Remediation and Culvert Replacement – Ryan Creek						
State Defined Wetland (California Coastal Commission)	463.31	0.01	42,397.36	0.97	42,860.67	0.98
Waters of the State (RWQCB)	502.41	0.01	17,647.94	0.41	18,150.35	0.42
Section 1600 Stream Feature (CDFW)	117.76	0.003	1,648.01	0.04	1,765.77	0.04
Total PG&E Pipeline Maintenance Project Impacts to State Jurisdictional Areas						
State Defined Wetland (California Coastal Commission)	3,463.33	0.08	138,136.8	3.17	141,600.13	3.25
Waters of the State (RWQCB)	2,737.40	0.06	62,275.43	1.44	65,012.83	1.50
Section 1600 Stream Feature (CDFW)	3,117.78	0.07	6,210.19	0.14	9,327.97	0.21

IMPACT CATEGORY: Potentially Significant Impact with Mitigation Required.

RECOMMENDED MITIGATION MEASURE – BIO-6:

- PG&E shall obtain all necessary permits for impacts to WoUS and wetlands from the Corps, CCC, NCRWQCB, and CDFW prior to project implementation. The project must comply with all permit conditions. Compensatory mitigation must be consistent with the regulatory agency standards pertaining to mitigation type, location, and ratios.
- Compensatory mitigation is required for permanent impacts to aquatic resources. The proposed project involves permanent impacts to 0.06-acre of federal waters of the U.S. and wetlands (Corps jurisdiction), 0.06-acre of waters of the state (RWQCB jurisdiction), 0.07-acre of Section 1600 stream features (CDFW jurisdiction), and 0.08-acre of state defined wetlands (CCC jurisdiction). The applicant may satisfy all or a portion of the compensatory mitigation through on- or off-site wetland creation, conservation easement, contribution to in-lieu habitat fund, or contribution to a regional wetland project, etc. The mitigation plan must be approved by the permitting agencies. The current conceptual mitigation plan for this project involves eradication of invasive dense flowered cord grass and restoration of approximately 17 acres of native tidal salt marsh and approximately 1.5 acres of freshwater marsh at the Park Street Marsh (also known as Dead Mouse Marsh) to compensate for the permanent impacts to federal and state jurisdictional aquatic resources. The Park Street Marsh is located in the same watershed as all of the pipeline maintenance sites and immediately adjacent to the R-354 site. The Conceptual Mitigation Plan has received preliminary agency approval for use as compensatory mitigation for wetland impacts. Refer to Appendix F for the Conceptual Mitigation Plan.
- Standard best management practices, such as the use of silt fencing and straw wattle, will be implemented within the disturbed area on each project site to minimize erosion, increased turbidity, and sedimentation to Ryan Creek, Ryan Slough, and Freshwater Slough during the site restoration phase of the project.
- Construction vehicles and equipment will be repaired and refueled a minimum of 100 feet from wetlands to the maximum extent feasible. If refueling or repairing equipment or vehicles in close proximity to wetlands is unavoidable, appropriate secondary spill containment will be used to prevent spills in sensitive habitats.
- After repair activities are complete, the project site and all disturbed areas will be seeded or hydroseeded with a native seed mix appropriate for the region. Restoration within grazed pasturelands will involve seeding or other restoration consistent with landowner right-of-way agreements and agency permit requirements.

IMPACT BIO-7: Construction of the pipeline projects will result in the removal of native tree species.

DISCUSSION: A total of 27 trees will be removed from the riparian corridor on Ryan Creek for access to the site, erosion repair, and installation of the culvert at this location (Figure 6). In addition, one arroyo willow will be removed for access to the east bank of Ryan Slough for removal of the exposed pipeline crossing. Table 6 outlines project related tree removal. Three of the trees to be removed are non-native species. The majority of riparian trees to be removed are very small trees, less than 6-inches in diameter at breast height (DBH). Only three of the riparian trees planned for removal exceed 12 inches at DBH and will require mitigation consistent with Coastal Commission requirements. These include one multi-stem red alder (aggregate 50-inches DBH) and one multi-stem arroyo willow (aggregate 12-inches DBH) at the RT-102 site and one multi-stem arroyo willow (aggregate 12-inches DBH) at the R-519 site. Because of the conflict associated with growing trees within pipeline easements, PG&E will accomplish any required mitigation for native tree removal at the Cock Robin Island mitigation site consistent with Coastal Commission mitigation requirements.

Table 6. Tree Removal at RT-102 and R-519 Sites			
Common Name	Scientific Name	Total Trees Removed	Range of DBH (inches)
Arroyo willow	<i>Salix lasiolepis</i>	4	3-12
Cascara	<i>Frangula purshiana</i>	5	2-4
Cherry plum	<i>Prunus cerasifera</i>	2	4-8
English holly	<i>Ilex aquifolium</i>	1	2
Grand fir	<i>Abies grandis</i>	12	2-6
Red alder	<i>Alnus rubra</i>	2	4-50 (multi-stem)
Red elderberry	<i>Sambucus racemosa</i>	2	5-10 (multi-stem)

Humboldt County does not have a tree ordinance; however, the Humboldt County General Plan has several policies that provide for protection and management of trees, specifically, the general plan policy BR-P13 provides measures for preservation of Landmark trees and General Plan Policy BR-P9 that provides measures for oak woodlands. Because there are no oak woodlands at the project sites and the project will not impact oak trees, the project will not result in a significant impact to oak woodlands. No landmark trees are proposed for removal as a result of the Project; therefore, the Project will not require a permit from Humboldt County.

The California Coastal Commission regulations require issuance of a coastal development permit (CDP) for removal of trees larger than 12-inches. The CDP typically requires mitigation for removal of riparian trees through the planting of replacement native trees at a 3:1 ratio.

IMPACT CATEGORY: Potentially Significant Impact with Mitigation Required.

RECOMMENDED MITIGATION MEASURE – BIO-7: The following recommended mitigation measures would further reduce project impacts from tree removal at the RT-102 and R-519 sites:

- Applicant shall obtain a CDP for the pipeline maintenance projects. Mitigation for removal of native riparian trees shall include replacement of native trees at a 3:1 ratio or other ratio as required by condition of the CDP.
- A Tree Protection Zone will be established around trees to be preserved in order to avoid root compaction during construction by limiting heavy equipment in root zones.
- The Tree Protection Zone will limit excavation or other ground disturbance to areas outside the dripline and root zone of trees remaining onsite.

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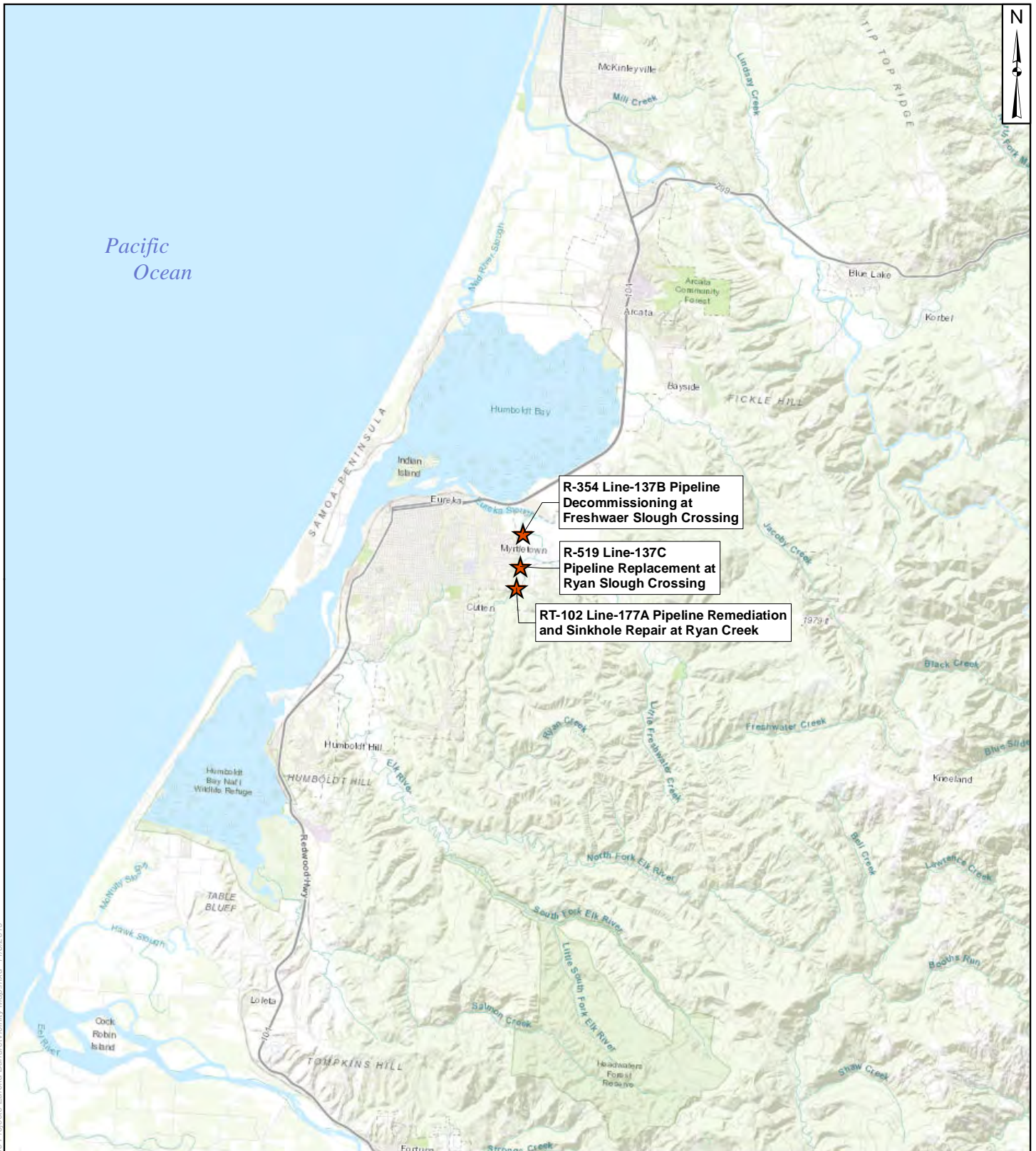
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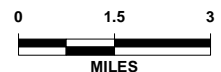
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FIGURES



LEGEND:

★ Project Site Location



Source: Esri Online Topo Basemap
 Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet
 Notes: This map was created for informational and display purposes only.

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PROJECT NAME: PG&E PIPELINE MAINTENANCE PROJECTS EUREKA, CALIFORNIA	
PROJECT NUMBER: 1702-2341	DATE: November 2019

VICINITY MAP

FIGURE
1

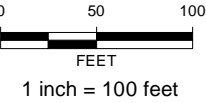


LEGEND:

- Bridge Crossing
- Study Area
- Vegetation Type**
 - Deschampsia caespitosa* Herbaceous Alliance (Tufted hairgrass meadow)
 - Distichlis spicata* Herbaceous Alliance (Salt grass flats)
 - Festuca perennis* Semi-Natural Herbaceous Stand (Perennial rye grass field)
 - Hesperocyperis macrocarpa* [Callitropsis macrocarpa] Grove (Monterey cypress grove)
 - Holcus lanatus*-*Anthoxanthum oderatum* Semi-Natural Herbaceous Alliance (Common velvet grass-sweet vernal grass meadows)
 - Rubus armeniacus* Semi-Natural Shrubland Stands (Himalayan blackberry brambles)
 - Rubus ursinus* Shrubland Alliance (Coastal brambles)
 - Salicornia pacifica* Herbaceous Alliance (Pickleweed mats)
 - Spartina densiflora* Semi-Natural Herbaceous Stand (Chilean cordgrass marshes)
 - Developed (roadway)
 - Open Water
 - Ruderal/Disturbed



MAP EXTENT:



Source: Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E R-354 PIPELINE DECOMMISSIONING PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: November 2019

VEGETATION MAP

FIGURE
2-1A





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LEGEND:

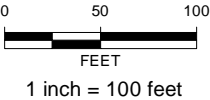
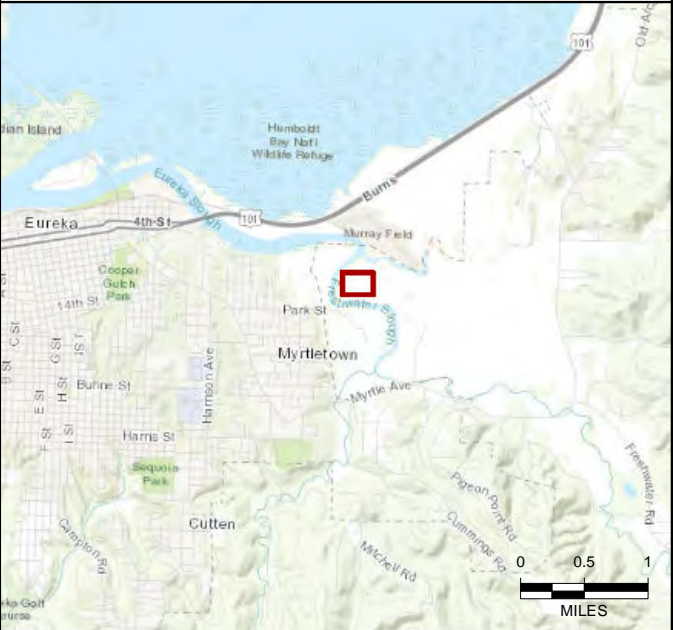
Study Area

Vegetation Type

-  *Alopecurus geniculatus* Provisional Herbaceous Alliance (Water foxtail meadows)
-  *Festuca perennis* Semi-Natural Herbaceous Stand (Perennial rye grass field)
-  *Rubus armeniacus* Semi-Natural Shrubland Stands (Himalayan blackberry brambles)
-  Developed (roadway)



MAP EXTENT:



Source: Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E R-354 PIPELINE
DECOMMISSIONING PROJECT
EUREKA, CA

PROJECT NUMBER:
1702-2341

DATE:
September 2019

VEGETATION MAP

FIGURE
2-1B

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LEGEND:

Study Area

Vegetation Type

Alopecurus geniculatus Provisional Herbaceous Alliance
(Water foxtail meadows)

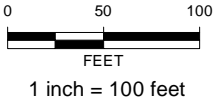
Festuca perennis Semi-Natural Herbaceous Stand
(Perennial rye grass field)

Developed (roadway)

Open Water



MAP EXTENT:



Source: Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E R-354 PIPELINE
DECOMMISSIONING PROJECT
EUREKA, CA

PROJECT NUMBER:
1702-2341

DATE:
September 2019

VEGETATION MAP

FIGURE
2-1C



LEGEND:

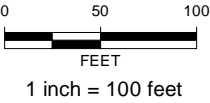
Study Area

Vegetation Type

Festuca perennis Semi-Natural Herbaceous Stand
(Perennial rye grass field)



MAP EXTENT:



Source: Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E R-354 PIPELINE
DECOMMISSIONING PROJECT
EUREKA, CA

PROJECT NUMBER:
1702-2341

DATE:
September 2019

VEGETATION MAP

FIGURE
2-1D

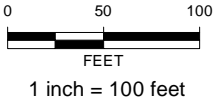
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LEGEND:
 Study Area
Vegetation Type
 Festuca perennis Semi-Natural Herbaceous Stand
(Perennial rye grass field)



MAP EXTENT:



Source: Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E R-354 PIPELINE
DECOMMISSIONING PROJECT
EUREKA, CA

PROJECT NUMBER:
1702-2341

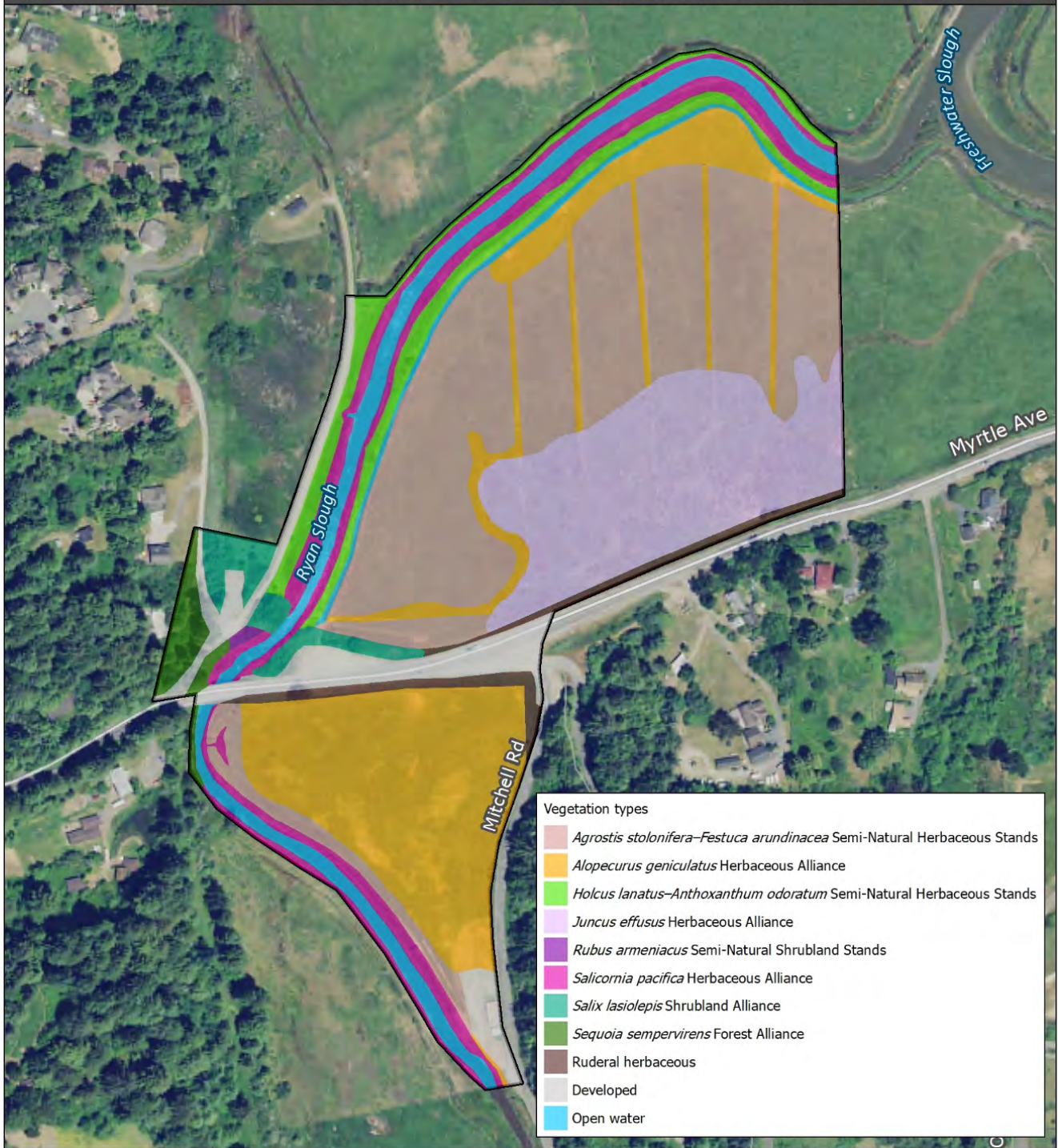
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VEGETATION MAP

FIGURE
2-1E

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PG&E GAS TRANSMISSION PIPELINE 137C RYAN SLOUGH CROSSING REPLACEMENT PROJECT



Source: Stillwater Sciences, 2018

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PROJECT NAME:
PG&E R-519 LINE 137C REMEDIATION PROJECT
EUREKA, CA

PROJECT NUMBER:
1702-2341

DATE:
November 2019

VEGETATION MAP

FIGURE
2-2



LEGEND:

- Culvert
- Access Route
- - - Intermittent/Ephemeral Channel
- - - Perennial Channel
- - - Wetland Swale
- Sinkhole Location
- Study Area
- Vegetation Type**
- Sequoia sempervirens (Redwood forest) Alliance
- Disturbed vegetation (recently cleared)
- Scirpus microcarpus (Small-fruited bulrush marsh) Alliance
- Alnus rubra (Red alder forest) Alliance
- Salix lasiolepis (Arroyo willow thickets) Alliance
- Sequoia sempervirens (Redwood forest) Alliance
- Disturbed vegetation (recently cleared)

MAP EXTENT:



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0 25 50
FEET
1 inch = 50 feet

Source: Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: Some vegetation mapping based on Stillwater Sciences 2017 survey.
This map was created for informational and display purposes only.

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PROJECT NAME:
PG&E RT-102 REMEDIATION PROJECT
EUREKA, CA
PROJECT NUMBER:
1702-2341
DATE:
November 2019

VEGETATION MAP

FIGURE
2-3A

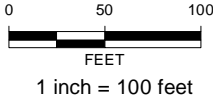


LEGEND:

- Access Route
- Perennial Channel
- Wetland Swale
- Study Area
- Vegetation Type**
 - Abies grandis* (Grand fir forest) Alliance
 - Carex obnupta* (Slough sedge swards) Alliance
 - Juncus effusus* (Soft rush marshes) Herbaceous Alliance
 - Lemna minor* (duckweed bloom) Provisional Alliance
 - Salix lasiolepis* (Arroyo willow thickets) Alliance
 - Sequoia sempervirens* (Redwood forest) Alliance
 - Disturbed vegetation (recently cleared)



MAP EXTENT:



Source: Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: Some vegetation mapping based on Stillwater Sciences 2017 survey.
This map was created for informational and display purposes only.



PROJECT NAME: PG&E RT-102 REMEDIATION PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: November 2019

VEGETATION MAP

FIGURE
2-3B

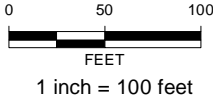


LEGEND:

- Access Route
- Perennial Channel
- Wetland Swale
- Study Area
- Vegetation Type**
- Abies grandis* (Grand fir forest) Alliance
- Alnus rubra* (Red alder forest) Alliance
- Carex obnupta* (Slough sedge swards) Alliance
- Lemna minor* (duckweed bloom) Provisional Alliance
- Salix lasiolepis* (Arroyo willow thickets) Alliance
- Scirpus microcarpus* (Small-fruited bulrush marsh) Alliance
- Sequoia sempervirens* (Redwood forest) Alliance
- Disturbed vegetation (recently cleared)



MAP EXTENT:



Source: Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: Some vegetation mapping based on Stillwater Sciences 2017 survey.
This map was created for informational and display purposes only.



PROJECT NAME: PG&E RT-102 REMEDIATION PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: November 2019

VEGETATION MAP

FIGURE
2-3C

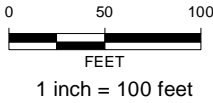


LEGEND:

- Culvert
- Access Route
- Perennial Channel
- Study Area
- Vegetation Type**
- Abies grandis (Grand fir forest) Alliance
- Carex obnupta (Slough sedge swards) Alliance
- Salix lasiolepis (Arroyo willow thickets) Alliance
- Sequoia sempervirens (Redwood forest) Alliance
- Disturbed vegetation (recently cleared)
- Ruderal/Ornamental



MAP EXTENT:



Source: Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: Some vegetation mapping based on Stillwater Sciences 2017 survey.
This map was created for informational and display purposes only.



PROJECT NAME: PG&E RT-102 REMEDIATION PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: November 2019

VEGETATION MAP

FIGURE
2-3D

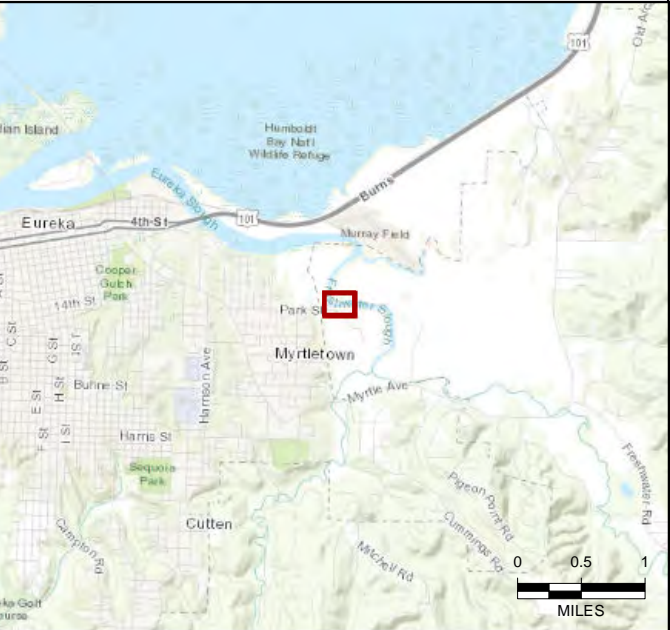


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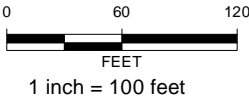
- Upland Sample Plot Location
- Wetland Sample Plot Location
- Control Point
- Mean High Tide Line
- Intermittent Channel (0.005 ac)
- Bridge Crossing
- Study Area (7.20 ac)
- Excavation Area (Pipeline Work and Staging)(0.23 ac)
- Permanent Impact Area (Bank Stabilization)(0.07 ac)
- Temporary Impact Area (2.10 ac)
- Waters of the U.S. (3.48 ac)**
 - Nontidal Waters (0.02 ac)
 - Tidal Marsh (0.20 ac)
 - Tidal Waters (1.06 ac)
 - Wet Meadow (2.22 ac)

R-354 Federal Jurisdictional Aquatic Resource Impacts			
Feature ID	Wetland Type	Area (ft ²)	Acreage
Permanent Impacts (Shoreline Stabilization Mats)			
W1	Wet Meadow	886.52	0.02
Freshwater Slough	Tidal Waters	1,348.47	0.03
Total Permanent Impact		2,234.99	0.05
Temporary Impact (Pipeline Decommissioning/Removal and Staging)			
W1	Wet Meadow	5,450.08	0.13
W3	Wet Meadow	172.43	0.00
W5	Wet Meadow	3,060.99	0.07
Freshwater Slough	Tidal Waters	1,231.44	0.03
Ch 1	Intermittent channel	120.00	0.003
Total Temporary Impact		10,034.94	0.23
Total Project Impact		12,269.93	0.28

MAP EXTENT:



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Source: Esri Online Basemap, Longitude123
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E R-354 PIPELINE DECOMMISSIONING PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: April 2020

PRELIMINARY FEDERAL AQUATIC RESOURCES PROJECT IMPACT MAP

FIGURE 3-1A



LEGEND:

- Upland Sample Plot Location
- Wetland Sample Plot Location
- Control Point
- Mean High Tide Line
- Intermittent Channel (0.005 ac)
- Bridge Crossing
- Study Area (7.20 ac)
- Excavation Area (Pipeline Work and Staging)(0.23 ac)
- Permanent Impact Area (Bank Stabilization)(0.07 ac)
- Temporary Impact Area (2.10 ac)
- Waters of the U.S. (3.48 ac)**
 - Nontidal Waters (0.02 ac)
 - Tidal Marsh (0.20 ac)
 - Tidal Waters (1.06 ac)
 - Wet Meadow (2.22 ac)

R-354 Federal Jurisdictional Aquatic Resource Impacts			
Feature ID	Wetland Type	Area (ft ²)	Acreage
Permanent Impacts (Shoreline Stabilization Mats)			
W1	Wet Meadow	886.52	0.02
Freshwater Slough	Tidal Waters	1,348.47	0.03
Total Permanent Impact		2,234.99	0.05
Temporary Impact (Pipeline Decommissioning/Removal and Staging)			
W1	Wet Meadow	5,450.08	0.13
W3	Wet Meadow	172.43	0.00
W5	Wet Meadow	3,060.99	0.07
Freshwater Slough	Tidal Waters	1,231.44	0.03
Ch 1	Intermittent channel	120.00	0.003
Total Temporary Impact		10,034.94	0.23
Total Project Impact		12,269.93	0.28

MAP EXTENT:



Z:\GIS Projects\GIS Maps\Map Project\PG&E Pipeline Projects Eureka\Bundled\R354 Preliminary Federal Aquatic Resources Delineation Overlay.mxd 4/10/2020

0 60 120
FEET
1 inch = 100 feet

Source: Esri Online Basemap, Longitude123
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.

padre
associates, inc.
ENGINEERS, GEOLOGISTS &
ENVIRONMENTAL SCIENTISTS

PROJECT NAME: PG&E R-354 PIPELINE
DECOMMISSIONING PROJECT
EUREKA, CA
PROJECT NUMBER: 1702-2341
DATE: April 2020

PRELIMINARY FEDERAL
AQUATIC RESOURCES
PROJECT IMPACT MAP

FIGURE
3-1B



LEGEND:

- Upland Sample Plot Location
- Wetland Sample Plot Location
- Control Point
- Mean High Tide Line
- Intermittent Channel (0.005 ac)
- Bridge Crossing
- Study Area (7.20 ac)
- Excavation Area (Pipeline Work and Staging)(0.23 ac)
- Permanent Impact Area (Bank Stabilization)(0.07 ac)
- Temporary Impact Area (2.10 ac)
- Waters of the U.S. (3.48 ac)**
 - Nontidal Waters (0.02 ac)
 - Tidal Marsh (0.20 ac)
 - Tidal Waters (1.06 ac)
 - Wet Meadow (2.22 ac)

R-354 Federal Jurisdictional Aquatic Resource Impacts			
Feature ID	Wetland Type	Area (ft ²)	Acreage
Permanent Impacts (Shoreline Stabilization Mats)			
W1	Wet Meadow	886.52	0.02
Freshwater Slough	Tidal Waters	1,348.47	0.03
Total Permanent Impact		2,234.99	0.05
Temporary Impact (Pipeline Decommissioning/Removal and Staging)			
W1	Wet Meadow	5,450.08	0.13
W3	Wet Meadow	172.43	0.00
W5	Wet Meadow	3,060.99	0.07
Freshwater Slough	Tidal Waters	1,231.44	0.03
Ch 1	Intermittent channel	120.00	0.003
Total Temporary Impact		10,034.94	0.23
Total Project Impact		12,269.93	0.28

MAP EXTENT:





LEGEND:

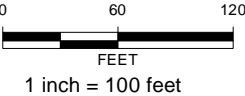
- Upland Sample Plot Location
- Wetland Sample Plot Location
- Control Point
- Mean High Tide Line
- Intermittent Channel (0.005 ac)
- Bridge Crossing
- Study Area (7.20 ac)
- Excavation Area (Pipeline Work and Staging)(0.23 ac)
- Permanent Impact Area (Bank Stabilization)(0.07 ac)
- Temporary Impact Area (2.10 ac)
- Waters of the U.S. (3.48 ac)**
 - Nontidal Waters (0.02 ac)
 - Tidal Marsh (0.20 ac)
 - Tidal Waters (1.06 ac)
 - Wet Meadow (2.22 ac)

R-354 Federal Jurisdictional Aquatic Resource Impacts			
Feature ID	Wetland Type	Area (ft ²)	Acreage
Permanent Impacts (Shoreline Stabilization Mats)			
W1	Wet Meadow	886.52	0.02
Freshwater Slough	Tidal Waters	1,348.47	0.03
Total Permanent Impact		2,234.99	0.05
Temporary Impact (Pipeline Decommissioning/Removal and Staging)			
W1	Wet Meadow	5,450.08	0.13
W3	Wet Meadow	172.43	0.00
W5	Wet Meadow	3,060.99	0.07
Freshwater Slough	Tidal Waters	1,231.44	0.03
Ch 1	Intermittent channel	120.00	0.003
Total Temporary Impact		10,034.94	0.23
Total Project Impact		12,269.93	0.28

MAP EXTENT:



Z:\GIS Projects\GIS Maps\Map Project\PG&E Pipeline Projects Eureka Bundle\R354 Preliminary Federal Aquatic Resources Delineation Overlay.mxd 4/10/2020



Source: Esri Online Basemap, Longitude123
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E R-354 PIPELINE DECOMMISSIONING PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: April 2020

PRELIMINARY FEDERAL
AQUATIC RESOURCES
PROJECT IMPACT MAP

FIGURE
3-1D



LEGEND:

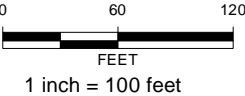
- Upland Sample Plot Location
- Wetland Sample Plot Location
- Control Point
- Mean High Tide Line
- Intermittent Channel (0.005 ac)
- Bridge Crossing
- Study Area (7.20 ac)
- Excavation Area (Pipeline Work and Staging)(0.23 ac)
- Permanent Impact Area (Bank Stabilization)(0.07 ac)
- Temporary Impact Area (2.10 ac)
- Waters of the U.S. (3.48 ac)**
 - Nontidal Waters (0.02 ac)
 - Tidal Marsh (0.20 ac)
 - Tidal Waters (1.06 ac)
 - Wet Meadow (2.22 ac)

R-354 Federal Jurisdictional Aquatic Resource Impacts			
Feature ID	Wetland Type	Area (ft ²)	Acreage
Permanent Impacts (Shoreline Stabilization Mats)			
W1	Wet Meadow	886.52	0.02
Freshwater Slough	Tidal Waters	1,348.47	0.03
Total Permanent Impact		2,234.99	0.05
Temporary Impact (Pipeline Decommissioning/Removal and Staging)			
W1	Wet Meadow	5,450.08	0.13
W3	Wet Meadow	172.43	0.00
W5	Wet Meadow	3,060.99	0.07
Freshwater Slough	Tidal Waters	1,231.44	0.03
Ch 1	Intermittent channel	120.00	0.003
Total Temporary Impact		10,034.94	0.23
Total Project Impact		12,269.93	0.28

MAP EXTENT:



Z:\GIS Projects\GIS Maps\Map Project\PG&E Pipeline Projects Eureka\Bundler\R354 Preliminary Federal Aquatic Resources Delineation Overlay.mxd 4/10/2020



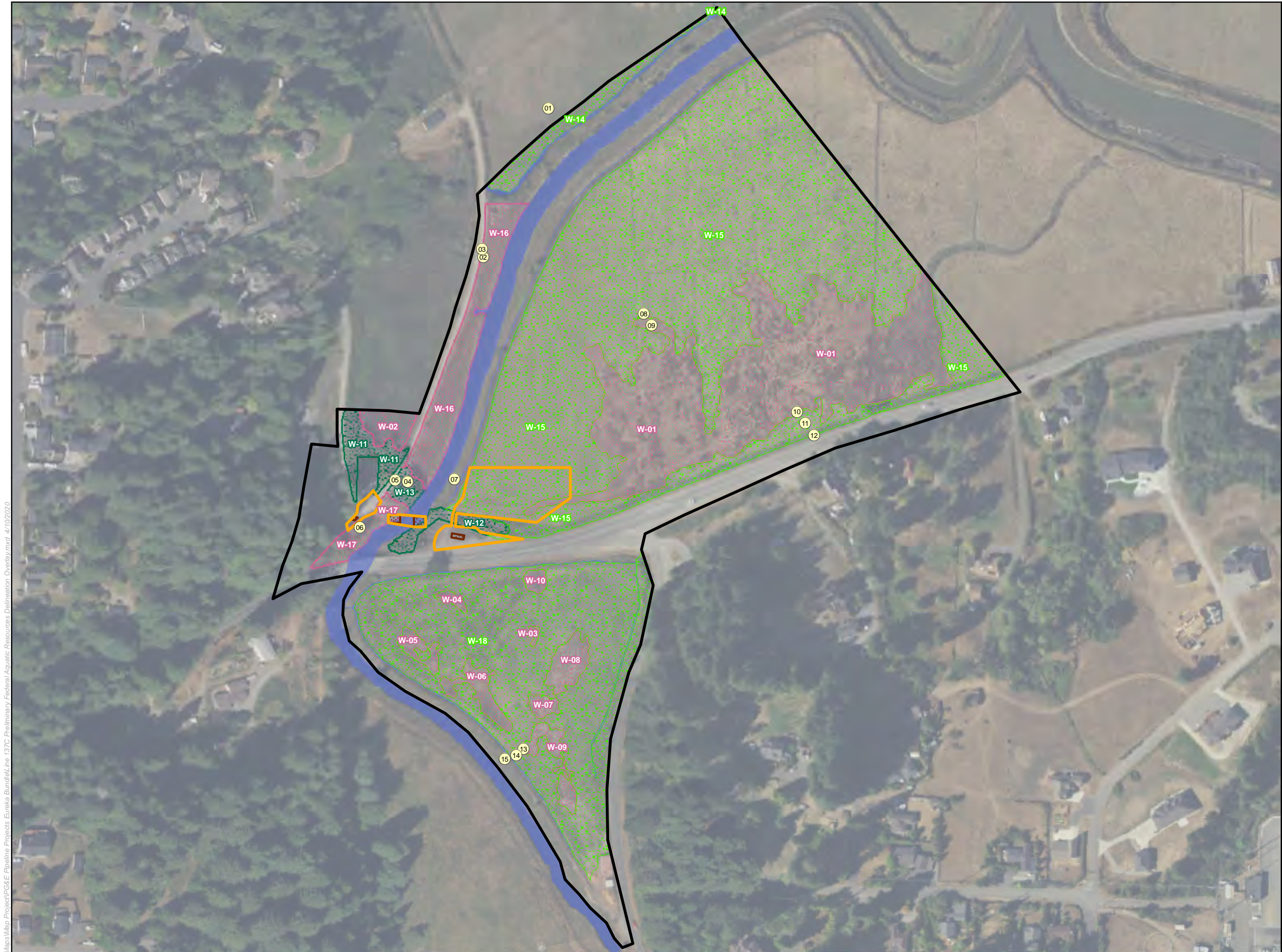
Source: Esri Online Basemap, Longitude123
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E R-354 PIPELINE DECOMMISSIONING PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: April 2020

PRELIMINARY FEDERAL AQUATIC RESOURCES PROJECT IMPACT MAP

FIGURE 3-1E

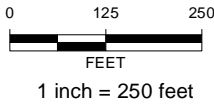


LEGEND:

- Study Area (37.9ac)
- Data Point (Stantec, 2017)
- Temporary Impact Area (Pipeline Replacement/Removal and Staging (0.97 ac)
- Excavation Area (0.04 ac)
- Waters of the U.S.**
 - Perennial Emergent Wetland (7.9ac)
 - Willow Riparian Shrub (0.69ac)
 - Wet Meadow (19.8ac)
 - Perennial Channel (2.9ac)

R-519 Federal Jurisdictional Aquatic Resource Impacts			
Feature ID	Wetland Type	Area (ft ²)	Acreage
Temporary Impact (Pipeline Replacement/Removal and Staging)			
W01	Perennial Emergent Wetland	1,768.28	0.04
W11	Willow Riparian Shrub	5.15	0.0001
W12	Willow Riparian Shrub	868.76	0.02
W15	Wet Meadow	29,683.40	0.68
W17	Perennial Emergent Wetland	813.02	0.02
Ryan Slough	Perennial Channel	1,573.91	0.04
Total Temporary Impact		34,712.53	0.80
Total Project Impact		34,712.53	0.80

MAP EXTENT:



Source: Esri Online Basemap, Longitude123, NAIP Imagery 2018, Stantec 2017
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E R-519 LINE 137C REMEDIATION PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: April 2020

PRELIMINARY FEDERAL
AQUATIC RESOURCES
PROJECT IMPACT MAP



- LEGEND:**
- Upland Sample Plot Location
 - Wetland Sample Plot Location
 - Culvert Location
 - Control Point
 - Access Route
 - Wetland Swale
 - Transect
 - Sinkhole Location
 - Study Area (2.64 ac)
 - Permanent Impact Area (Culvert Intake/Outfall)(0.01 ac)
 - Temporary Impact Area (Sinkhole Repair)(0.98 ac)
 - Excavation Area (0.11 ac)
 - Ordinary High Water Mark (OHWM)
 - Waters of the U.S. (1.05 ac)**
 - Forested Wetland (0.13 ac)
 - Scrub-Shrub Wetland (0.66 ac)
 - Wet Meadow (0.13 ac)
 - Intermittent Channel (0.01 ac)
 - Perennial Channel (0.13 ac)

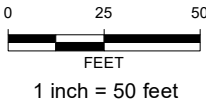


RT-102 Federal Jurisdictional Aquatic Resource Impacts			
Feature ID	Wetland Type	Area (ft ²)	Acreage
Permanent Impacts (Culvert Intake/Outfall)			
W1	Forested Wetland	369.53	0.008
Ryan Creek	Perennial Channel	7.88	0.0002
Channel 1	Intermittent Channel	125.00	0.003
Total Permanent Impact		502.41	0.011
Temporary Impact (Sinkhole Repair)			
W1	Forested Wetland	1,591.42	0.04
W2	Wet Meadow	865.14	0.02
W3	Scrub-Shrub Wetland	12,310.23	0.28
W4	Wet Meadow	2,125.95	0.05
Ryan Creek	Perennial Channel	755.20	0.02
Total Temporary Impact		17,647.95	0.41
Total Project Impact		18,150.35	0.42

MAP EXTENT:



PG&E Projects\GIS Maps\Map Project\PG&E Pipeline Projects\Eureka\RT-102 Preliminary Federal Aquatic Resources Delineation Overlay.mxd 4/10/2020



Source: Esri Online Basemap, Longitude123
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E RT-102 REMEDIATION PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: April 2020

PRELIMINARY FEDERAL
AQUATIC RESOURCES
PROJECT IMPACT MAP

FIGURE
3-3A



LEGEND:

- Upland Sample Plot Location
- Wetland Sample Plot Location
- Culvert Location
- Control Point
- Access Route
- Wetland Swale
- Transect
- Sinkhole Location
- Study Area (2.64 ac)
- Permanent Impact Area (Culvert Intake/Outfall)(0.01 ac)
- Temporary Impact Area (Sinkhole Repair)(0.98 ac)
- Excavation Area (0.11 ac)
- Ordinary High Water Mark (OHWM)
- Waters of the U.S. (1.05 ac)**
 - Forested Wetland (0.13 ac)
 - Scrub-Shrub Wetland (0.66 ac)
 - Wet Meadow (0.13 ac)
 - Intermittent Channel (0.01 ac)
 - Perennial Channel (0.13 ac)

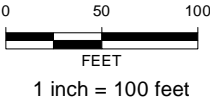
N

RT-102 Federal Jurisdictional Aquatic Resource Impacts			
Feature ID	Wetland Type	Area (ft ²)	Acreage
Permanent Impacts (Culvert Intake/Outfall)			
W1	Forested Wetland	369.53	0.008
Ryan Creek	Perennial Channel	7.88	0.0002
Channel 1	Intermittent Channel	125.00	0.003
Total Permanent Impact		502.41	0.011
Temporary Impact (Sinkhole Repair)			
W1	Forested Wetland	1,591.42	0.04
W2	Wet Meadow	865.14	0.02
W3	Scrub-Shrub Wetland	12,310.23	0.28
W4	Wet Meadow	2,125.95	0.05
Ryan Creek	Perennial Channel	755.20	0.02
Total Temporary Impact		17,647.95	0.41
Total Project Impact		18,150.35	0.42

MAP EXTENT:



20230513 PG&E RT-102 Remediation Project PG&E Pipeline Projects Eureka RT-102 Preliminary Federal Aquatic Resource Delineation Overlay.mxd 4/10/2020



Source: Esri Online Basemap, Longitude123
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E RT-102 REMEDIATION PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: April 2020

PRELIMINARY FEDERAL
AQUATIC RESOURCES
PROJECT IMPACT MAP

FIGURE
3-3B

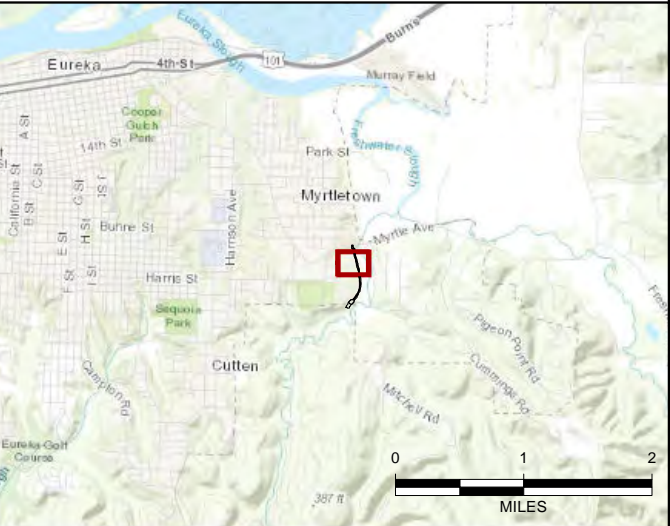


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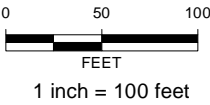
- Upland Sample Plot Location
- Wetland Sample Plot Location
- Culvert Location
- ✚ Control Point
- Access Route
- ~ Wetland Swale
- Transect
- Sinkhole Location
- Study Area (2.64 ac)
- Permanent Impact Area (Culvert Intake/Outfall)(0.01 ac)
- Temporary Impact Area (Sinkhole Repair)(0.98 ac)
- Excavation Area (0.11 ac)
- Ordinary High Water Mark (OHWM)
- Waters of the U.S. (1.05 ac)**
 - Forested Wetland (0.13 ac)
 - Scrub-Shrub Wetland (0.66 ac)
 - Wet Meadow (0.13 ac)
 - Intermittent Channel (0.01 ac)
 - Perennial Channel (0.13 ac)

RT-102 Federal Jurisdictional Aquatic Resource Impacts			
Feature ID	Wetland Type	Area (ft ²)	Acreage
Permanent Impacts (Culvert Intake/Outfall)			
W1	Forested Wetland	369.53	0.008
Ryan Creek	Perennial Channel	7.88	0.0002
Channel 1	Intermittent Channel	125.00	0.003
Total Permanent Impact		502.41	0.011
Temporary Impact (Sinkhole Repair)			
W1	Forested Wetland	1,591.42	0.04
W2	Wet Meadow	865.14	0.02
W3	Scrub-Shrub Wetland	12,310.23	0.28
W4	Wet Meadow	2,125.95	0.05
Ryan Creek	Perennial Channel	755.20	0.02
Total Temporary Impact		17,647.95	0.41
Total Project Impact		18,150.35	0.42

MAP EXTENT:



2:GIS Projects\GIS Maps\Map Project\PG&E Pipeline Projects Eureka\RT-102 Preliminary Federal Aquatic Resources Delineation Overlay.mxd 4/10/2020



Source: Esri Online Basemap, Longitude123
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E RT-102 REMEDIATION PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: April 2020

PRELIMINARY FEDERAL
AQUATIC RESOURCES
PROJECT IMPACT MAP

FIGURE
3-3C



LEGEND:

- Upland Sample Plot Location
- Wetland Sample Plot Location
- Culvert Location
- ✚ Control Point
- Access Route
- ~ Wetland Swale
- Transect
- Sinkhole Location
- Study Area (2.64 ac)
- Permanent Impact Area (Culvert Intake/Outfall)(0.01 ac)
- Temporary Impact Area (Sinkhole Repair)(0.98 ac)
- Excavation Area (0.11 ac)
- Ordinary High Water Mark (OHWM)
- Waters of the U.S. (1.05 ac)**
 - Forested Wetland (0.13 ac)
 - Scrub-Shrub Wetland (0.66 ac)
 - Wet Meadow (0.13 ac)
 - Intermittent Channel (0.01 ac)
 - Perennial Channel (0.13 ac)

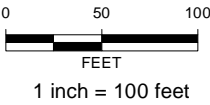
N

RT-102 Federal Jurisdictional Aquatic Resource Impacts			
Feature ID	Wetland Type	Area (ft ²)	Acreage
Permanent Impacts (Culvert Intake/Outfall)			
W1	Forested Wetland	369.53	0.008
Ryan Creek	Perennial Channel	7.88	0.0002
Channel 1	Intermittent Channel	125.00	0.003
Total Permanent Impact		502.41	0.011
Temporary Impact (Sinkhole Repair)			
W1	Forested Wetland	1,591.42	0.04
W2	Wet Meadow	865.14	0.02
W3	Scrub-Shrub Wetland	12,310.23	0.28
W4	Wet Meadow	2,125.95	0.05
Ryan Creek	Perennial Channel	755.20	0.02
Total Temporary Impact		17,647.95	0.41
Total Project Impact		18,150.35	0.42

MAP EXTENT:



PG&E Projects\GIS Maps\Map Project\PG&E Pipeline Projects Eureka\RT-102 Preliminary Federal Aquatic Resources Delineation Overlay.mxd 4/10/2020



Source: Esri Online Basemap, Longitude123
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E RT-102 REMEDIATION PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: April 2020

PRELIMINARY FEDERAL
AQUATIC RESOURCES
PROJECT IMPACT MAP

FIGURE
3-3D



LEGEND:

- Sample Location
- + Control Point
- Mean High Tide Line
- Bridge Crossing
- Study Area (7.20 ac)
- Permanent Impact Area (Bank Stabilization)(0.07 ac)
- Temporary Impact Area (2.10 ac)
- Excavation Area (Pipeline Work and Staging)(0.23 ac)
- Section 1600 Stream Feature - California Department of Fish & Wildlife (1.49 ac)
- State-Defined Wetland - California Coastal Commission (5.35 ac)
- Waters of the State - Regional Water Quality Control Board (3.48 acres)

R-354 State Jurisdictional Aquatic Resource Impacts		
State Agency Jurisdiction	Area (ft ²)	Acreage
Permanent Impacts (Shoreline Stabilization Mats)		
Section 1600 Stream Feature (CDFW)	3,000.02	0.07
State-Defined Wetland (Coastal Commission)	3,000.02	0.07
Waters of the State (RWQCB)	2,234.99	0.05
Temporary Impact (Pipeline Decommissioning/Removal and Staging)		
Section 1600 Stream Feature (CDFW)	1,888.66	0.04
State-Defined Wetland (Coastal Commission)	61,002.91	1.40
Waters of the State (RWQCB)	9,914.94	0.23

MAP EXTENT:



0 50 100
FEET
1 inch = 100 feet

Source: Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.

padre
associates, inc.
ENGINEERS, GEOLOGISTS &
ENVIRONMENTAL SCIENTISTS

PROJECT NAME: PG&E R-354 PIPELINE
DECOMMISSIONING PROJECT
EUREKA, CA
PROJECT NUMBER: 1702-2341
DATE: April 2020

PRELIMINARY STATE AQUATIC
RESOURCES IMPACT MAP

FIGURE
4-1A



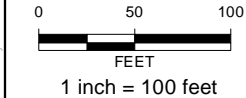
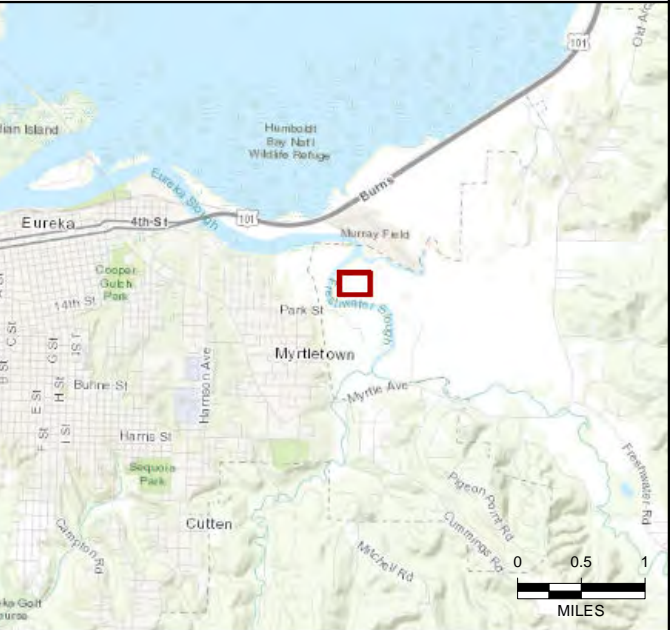
LEGEND:

- Sample Location
- + Control Point
- Mean High Tide Line
- Bridge Crossing
- Study Area (7.20 ac)
- Permanent Impact Area (Bank Stabilization)(0.07 ac)
- Temporary Impact Area (2.10 ac)
- Excavation Area (Pipeline Work and Staging)(0.23 ac)
- Section 1600 Stream Feature - California Department of Fish & Wildlife (1.49 ac)
- State-Defined Wetland - California Coastal Commission (5.35 ac)
- Waters of the State - Regional Water Quality Control Board (3.48 acres)



R-354 State Jurisdictional Aquatic Resource Impacts		
State Agency Jurisdiction	Area (ft ²)	Acreage
Permanent Impacts (Shoreline Stabilization Mats)		
Section 1600 Stream Feature (CDFW)	3,000.02	0.07
State-Defined Wetland (Coastal Commission)	3,000.02	0.07
Waters of the State (RWQCB)	2,234.99	0.05
Temporary Impact (Pipeline Decommissioning/Removal and Staging)		
Section 1600 Stream Feature (CDFW)	1,888.66	0.04
State-Defined Wetland (Coastal Commission)	61,002.91	1.40
Waters of the State (RWQCB)	9,914.94	0.23

MAP EXTENT:



Source: Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E R-354 PIPELINE DECOMMISSIONING PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: April 2020

PRELIMINARY STATE AQUATIC RESOURCES IMPACT MAP

FIGURE 4-1B



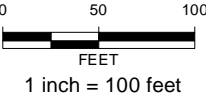
LEGEND:

- Sample Location
- + Control Point
- Mean High Tide Line
- Bridge Crossing
- Study Area (7.20 ac)
- Permanent Impact Area (Bank Stabilization)(0.07 ac)
- Temporary Impact Area (2.10 ac)
- Excavation Area (Pipeline Work and Staging)(0.23 ac)
- Section 1600 Stream Feature - California Department of Fish & Wildlife (1.49 ac)
- State-Defined Wetland - California Coastal Commission (5.35 ac)
- Waters of the State - Regional Water Quality Control Board (3.48 acres)



R-354 State Jurisdictional Aquatic Resource Impacts		
State Agency Jurisdiction	Area (ft ²)	Acreage
Permanent Impacts (Shoreline Stabilization Mats)		
Section 1600 Stream Feature (CDFW)	3,000.02	0.07
State-Defined Wetland (Coastal Commission)	3,000.02	0.07
Waters of the State (RWQCB)	2,234.99	0.05
Temporary Impact (Pipeline Decommissioning/Removal and Staging)		
Section 1600 Stream Feature (CDFW)	1,888.66	0.04
State-Defined Wetland (Coastal Commission)	61,002.91	1.40
Waters of the State (RWQCB)	9,914.94	0.23

MAP EXTENT:



Source: Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E R-354 PIPELINE DECOMMISSIONING PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: April 2020

PRELIMINARY STATE AQUATIC RESOURCES IMPACT MAP

FIGURE 4-1C

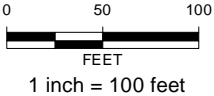


LEGEND:

- Sample Location
- + Control Point
- Mean High Tide Line
- Bridge Crossing
- Study Area (7.20 ac)
- Permanent Impact Area (Bank Stabilization)(0.07 ac)
- Temporary Impact Area (2.10 ac)
- Excavation Area (Pipeline Work and Staging)(0.23 ac)
- Section 1600 Stream Feature - California Department of Fish & Wildlife (1.49 ac)
- State-Defined Wetland - California Coastal Commission (5.35 ac)
- Waters of the State - Regional Water Quality Control Board (3.48 acres)

R-354 State Jurisdictional Aquatic Resource Impacts		
State Agency Jurisdiction	Area (ft ²)	Acreage
Permanent Impacts (Shoreline Stabilization Mats)		
Section 1600 Stream Feature (CDFW)	3,000.02	0.07
State-Defined Wetland (Coastal Commission)	3,000.02	0.07
Waters of the State (RWQCB)	2,234.99	0.05
Temporary Impact (Pipeline Decommissioning/Removal and Staging)		
Section 1600 Stream Feature (CDFW)	1,888.66	0.04
State-Defined Wetland (Coastal Commission)	61,002.91	1.40
Waters of the State (RWQCB)	9,914.94	0.23

MAP EXTENT:



Source: Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E R-354 PIPELINE DECOMMISSIONING PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: April 2020

PRELIMINARY STATE AQUATIC RESOURCES IMPACT MAP

FIGURE 4-1D



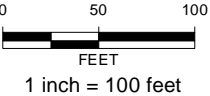
LEGEND:

- Sample Location
- + Control Point
- Mean High Tide Line
- Bridge Crossing
- Study Area (7.20 ac)
- Permanent Impact Area (Bank Stabilization)(0.07 ac)
- Temporary Impact Area (2.10 ac)
- Excavation Area (Pipeline Work and Staging)(0.23 ac)
- Section 1600 Stream Feature - California Department of Fish & Wildlife (1.49 ac)
- State-Defined Wetland - California Coastal Commission (5.35 ac)
- Waters of the State - Regional Water Quality Control Board (3.48 acres)



R-354 State Jurisdictional Aquatic Resource Impacts		
State Agency Jurisdiction	Area (ft ²)	Acreage
Permanent Impacts (Shoreline Stabilization Mats)		
Section 1600 Stream Feature (CDFW)	3,000.02	0.07
State-Defined Wetland (Coastal Commission)	3,000.02	0.07
Waters of the State (RWQCB)	2,234.99	0.05
Temporary Impact (Pipeline Decommissioning/Removal and Staging)		
Section 1600 Stream Feature (CDFW)	1,888.66	0.04
State-Defined Wetland (Coastal Commission)	61,002.91	1.40
Waters of the State (RWQCB)	9,914.94	0.23

MAP EXTENT:



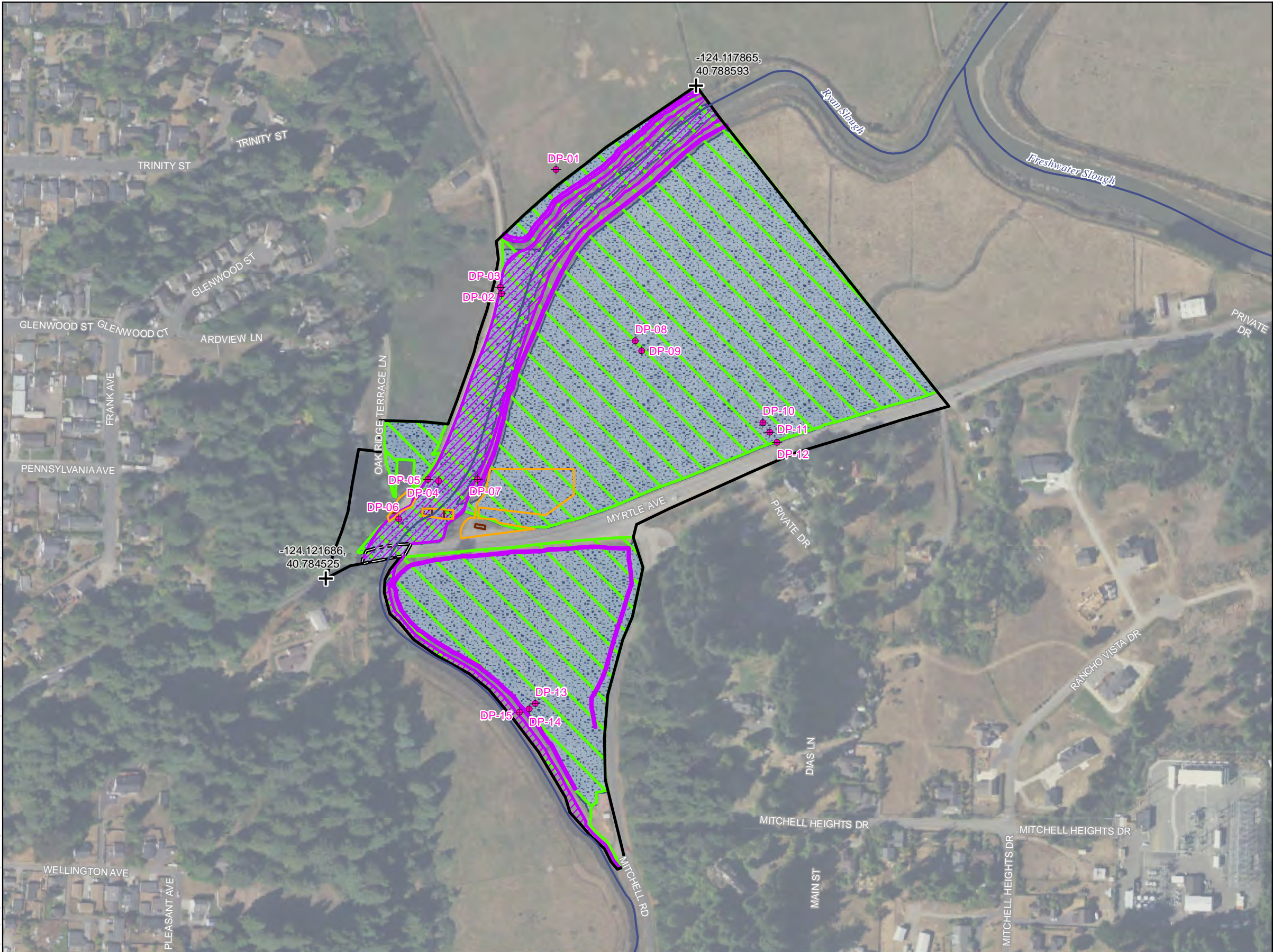
Source: Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E R-354 PIPELINE DECOMMISSIONING PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: April 2020

PRELIMINARY STATE AQUATIC RESOURCES IMPACT MAP

FIGURE 4-1E

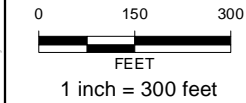


LEGEND:

- Control Point
- Delineation Data Points (Stantec, 2017)
- Bridge Crossing
- Study Area (37.85 acres)
- Temporary Impact Area (Pipeline Replacement/Removal and Staging) (0.97 ac)
- Excavation Area (0.04 ac)
- Section 1600 Stream Feature - California Department of Fish & Wildlife (5.13 acres)
- State-Defined Wetland - California Coastal Commission (33.84 acres)
- Waters of the State - Regional Water Quality Control Board (30.42 acres)

R-519 State Jurisdictional Aquatic Resource Impacts		
State Agency Jurisdiction	Area (ft ²)	Acreage
Temporary Impact (Pipeline Replacement/Removal and Staging)		
Section 1600 Stream Feature (CDFW)	2,673.52	0.06
State-Defined Wetland (Coastal Commission)	34,736.53	0.80
Waters of the State (RWQCB)	34,712.55	0.80

MAP EXTENT:



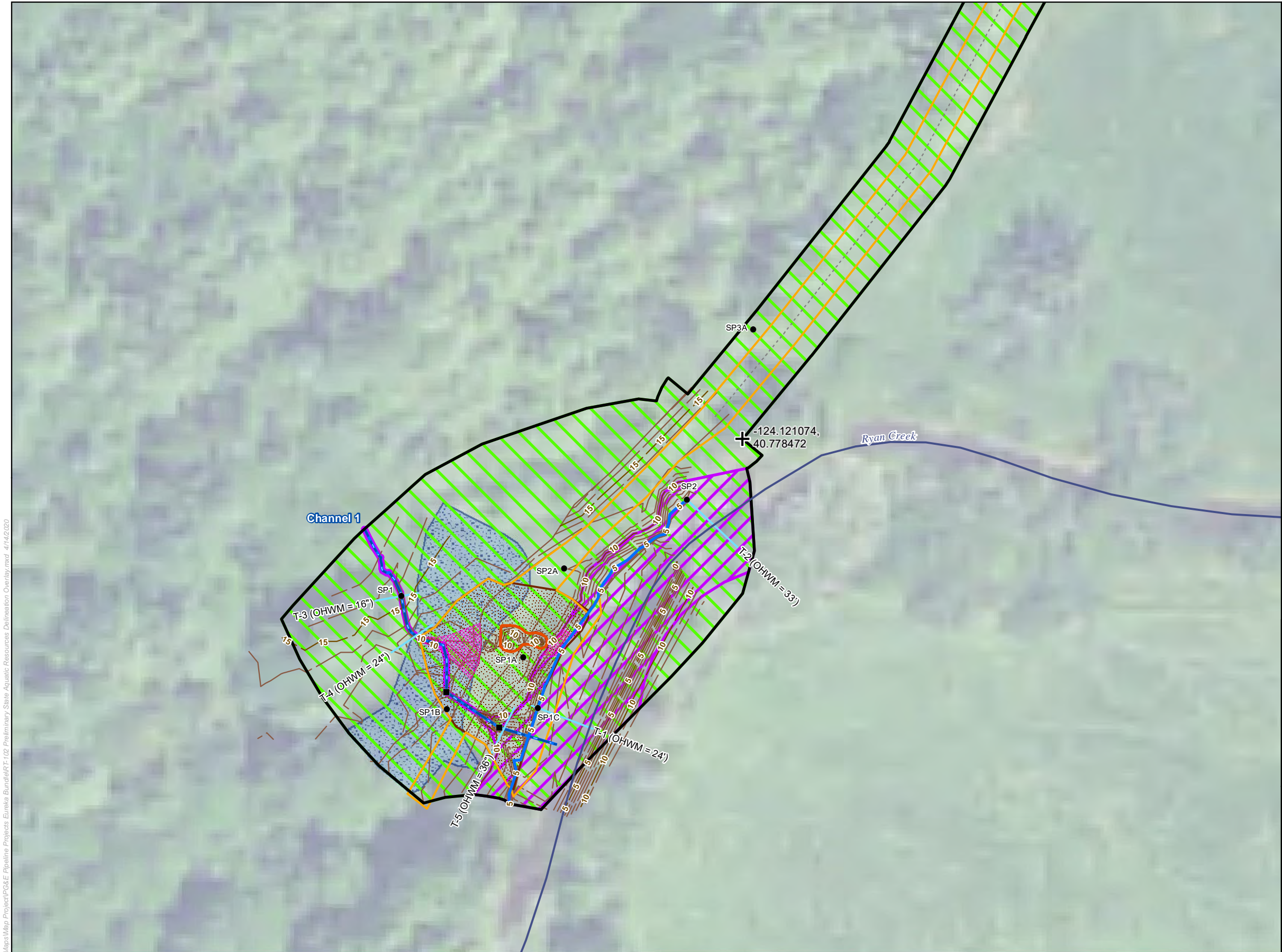
Source: NAIP Imagery 2018
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME:		PG&E R-519 L137C RYAN SLOUGH CROSSING PIPELINE REPLACEMENT PROJECT EUREKA, CA	
PROJECT NUMBER:		DATE:	
1702-2341		April 2020	

PRELIMINARY STATE AQUATIC
RESOURCES IMPACT MAP

FIGURE
4-2



LEGEND:

- Sample Location
- Culvert Location
- + Control Point
- - - Access Route
- Ordinary High Water Mark (OHWM)
- ~ Wetland Swale
- Transect
- Sinkhole Location
- Study Area (2.64 ac)
- Permanent Impact Area (Culvert Intake/Outfall)(0.01 ac)
- Temporary Impact Area (Sinkhole Repair)(0.98 ac)
- Excavation Area (0.11 ac)
- Section 1600 Stream Feature - California Department of Fish & Wildlife (0.21 ac)
- State-Defined Wetland - California Coastal Commission (2.64 ac)
- Waters of the State - Regional Water Quality Control Board (1.05 ac)
- Intermittent Channel (0.01 ac)
- Perennial Channel (0.13 ac)

RT-102 State Jurisdictional Aquatic Resource Impacts		
State Agency Jurisdiction	Area (ft ²)	Acreage
Permanent Impacts (Culvert Intake/Outfall)		
Section 1600 Stream Feature (CDFW)	117.76	0.003
State-Defined Wetland (Coastal Commission)	463.31	0.011
Waters of the State (RWQCB) ¹	502.41	0.011
Temporary Impact (Sinkhole Repair)		
Section 1600 Stream Feature (CDFW)	1,648.01	0.04
State-Defined Wetland (Coastal Commission)	42,397.36	0.97
Waters of the State (RWQCB)	17,647.94	0.41

MAP EXTENT:



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0 25 50
FEET
1 inch = 50 feet

Source: NAIP Imagery 2016
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: ' = Includes permanent impact to segment of Channel 1 surface flow that will be underground after culvert replacement.
This map was created for informational and display purposes only.

padre
associates, inc.
ENGINEERS, GEOLOGISTS &
ENVIRONMENTAL SCIENTISTS

PROJECT NAME:
PG&E RT-102 REMEDIATION PROJECT
EUREKA, CA
PROJECT NUMBER:
1702-2341
DATE:
April 2020

PRELIMINARY AQUATIC STATE
RESOURCES IMPACT MAP

FIGURE
4-3A

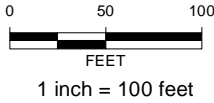


- LEGEND:**
- Sample Location
 - Culvert Location
 - + Control Point
 - - - Access Route
 - Ordinary High Water Mark (OHWM)
 - ~ Wetland Swale
 - Transect
 - Sinkhole Location
 - Study Area (2.64 ac)
 - Permanent Impact Area (Culvert Intake/Outfall)(0.01 ac)
 - Temporary Impact Area (Sinkhole Repair)(0.98 ac)
 - Excavation Area (0.11 ac)
 - Section 1600 Stream Feature - California Department of Fish & Wildlife (0.21 ac)
 - State-Defined Wetland - California Coastal Commission (2.64 ac)
 - Waters of the State - Regional Water Quality Control Board (1.05 ac)
 - Intermittent Channel (0.01 ac)
 - Perennial Channel (0.13 ac)

RT-102 State Jurisdictional Aquatic Resource Impacts		
State Agency Jurisdiction	Area (ft ²)	Acreage
Permanent Impacts (Culvert Intake/Outfall)		
Section 1600 Stream Feature (CDFW)	117.76	0.003
State-Defined Wetland (Coastal Commission)	463.31	0.011
Waters of the State (RWQCB) ¹	502.41	0.011
Temporary Impact (Sinkhole Repair)		
Section 1600 Stream Feature (CDFW)	1,648.01	0.04
State-Defined Wetland (Coastal Commission)	42,397.36	0.97
Waters of the State (RWQCB)	17,647.94	0.41



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Source: NAIP Imagery 2016
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: ¹ = Includes permanent impact to segment of Channel 1 surface flow that will be underground after culvert replacement.
This map was created for informational and display purposes only.



PROJECT NAME: PG&E RT-102 REMEDIATION PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: April 2020

**PRELIMINARY AQUATIC STATE
RESOURCES IMPACT MAP**

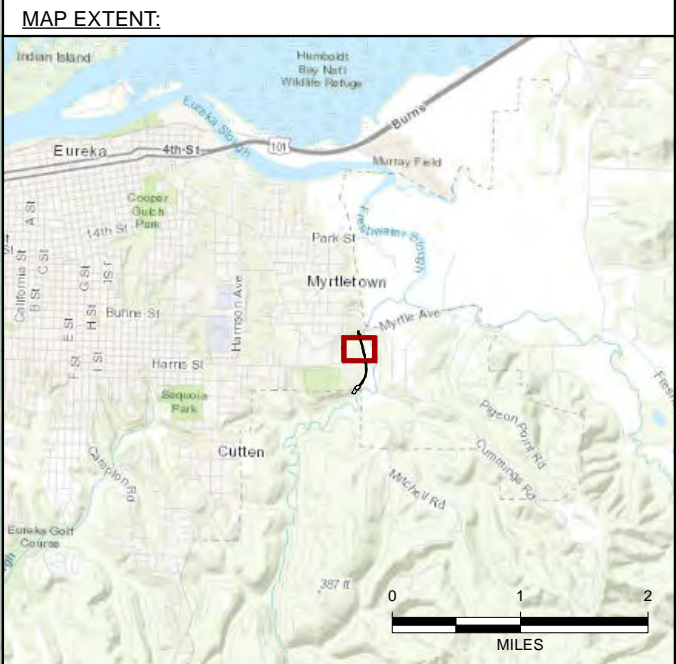
**FIGURE
4-3B**



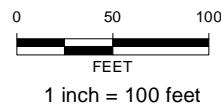
LEGEND:

- Sample Location
- Culvert Location
- ✚ Control Point
- Access Route
- Ordinary High Water Mark (OHWM)
- Wetland Swale
- Transect
- Sinkhole Location
- Study Area (2.64 ac)
- Permanent Impact Area (Culvert Intake/Outfall)(0.01 ac)
- Temporary Impact Area (Sinkhole Repair)(0.98 ac)
- Excavation Area (0.11 ac)
- Section 1600 Stream Feature - California Department of Fish & Wildlife (0.21 ac)
- State-Defined Wetland - California Coastal Commission (2.64 ac)
- Waters of the State - Regional Water Quality Control Board (1.05 ac)
- Intermittent Channel (0.01 ac)
- Perennial Channel (0.13 ac)

RT-102 State Jurisdictional Aquatic Resource Impacts		
State Agency Jurisdiction	Area (ft ²)	Acreage
Permanent Impacts (Culvert Intake/Outfall)		
Section 1600 Stream Feature (CDFW)	117.76	0.003
State-Defined Wetland (Coastal Commission)	463.31	0.011
Waters of the State (RWQCB) ¹	502.41	0.011
Temporary Impact (Sinkhole Repair)		
Section 1600 Stream Feature (CDFW)	1,648.01	0.04
State-Defined Wetland (Coastal Commission)	42,397.36	0.97
Waters of the State (RWQCB)	17,647.94	0.41



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Source: NAIP Imagery 2016
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: ¹ = Includes permanent impact to segment of Channel 1 surface flow that will be underground after culvert replacement.
This map was created for informational and display purposes only.



PROJECT NAME: PG&E RT-102 REMEDIATION PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: April 2020

**PRELIMINARY AQUATIC STATE
RESOURCES IMPACT MAP**

**FIGURE
4-3C**



N

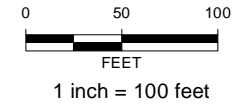
LEGEND:

- Sample Location
- Culvert Location
- ✚ Control Point
- - - Access Route
- Ordinary High Water Mark (OHWM)
- ~ Wetland Swale
- Transect
- ◻ Sinkhole Location
- ◻ Study Area (2.64 ac)
- ◻ Permanent Impact Area (Culvert Intake/Outfall)(0.01 ac)
- ◻ Temporary Impact Area (Sinkhole Repair)(0.98 ac)
- ◻ Excavation Area (0.11 ac)
- ◻ Section 1600 Stream Feature - California Department of Fish & Wildlife (0.21 ac)
- ◻ State-Defined Wetland - California Coastal Commission (2.64 ac)
- ◻ Waters of the State - Regional Water Quality Control Board (1.05 ac)
- Intermittent Channel (0.01 ac)
- Perennial Channel (0.13 ac)

RT-102 State Jurisdictional Aquatic Resource Impacts		
State Agency Jurisdiction	Area (ft ²)	Acreage
Permanent Impacts (Culvert Intake/Outfall)		
Section 1600 Stream Feature (CDFW)	117.76	0.003
State-Defined Wetland (Coastal Commission)	463.31	0.011
Waters of the State (RWQCB) ¹	502.41	0.011
Temporary Impact (Sinkhole Repair)		
Section 1600 Stream Feature (CDFW)	1,648.01	0.04
State-Defined Wetland (Coastal Commission)	42,397.36	0.97
Waters of the State (RWQCB)	17,647.94	0.41



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Source: NAIP Imagery 2016
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: ¹ = Includes permanent impact to segment of Channel 1 surface flow that will be underground after culvert replacement.
This map was created for informational and display purposes only.



PROJECT NAME: PG&E RT-102 REMEDIATION PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: April 2020

**PRELIMINARY AQUATIC STATE
RESOURCES IMPACT MAP**

**FIGURE
4-3D**

Figure 5 – Special Status Species Occurrences:

CNDDDB Geospatial Data is Confidential - Figure available upon request.



LEGEND:

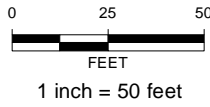
- Culvert Location
- Control Point
- Access Route
- 1-ft Contour
- 5-ft Contour
- Sinkhole Location
- Study Area (2.64 acres)
- Permanent Impact Area (Culvert Intake/Outfall)(0.01 ac)
- Temporary Impact Area (Sinkhole Repair)(0.98 ac)
- Perennial Channel (0.13 acres)
- Intermittent Channel (0.003 acres)
- Impacted Tree Removed for Project

Surveyed Trees

- Arroyo willow (*Salix lasiolepis*)
- Cascara (*Frangula purshiana*)
- Cherry plum (*Prunus cerasifera*)
- Coast redwood (*Sequoia sempervirens*)
- Douglas fir (*Pseudotsuga menziesii*)
- English holly (*Ilex aquifolium*)
- Grand fir (*Abies grandis*)
- Red alder (*Alnus rubra*)
- Red elderberry (*Sambucus racemosa*)



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Source: Esri Online Basemap, Longitude123
Coordinate System: NAD 1983 StatePlane California 1 FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E RT-102 REMEDIATION PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: November 2019

TREE IMPACT MAP

Photograph A.
North view of
pipeline removal
crossing at R-354
Site on
Freshwater
Slough. Exposed
pipe and concrete
anti-seepage wall
visible on eroded
north bank.
Photograph taken
7/18/19.



Photograph B.
View of exposed
pipe and
concrete anti-
seepage wall on
north bank of
Freshwater
Slough.
Photograph
taken 7/18/19.



Figure 7
Site Photographs
PG&E Pipeline Maintenance Projects

Photograph C.
West view of
pipeline removal
crossing at R-354
Site on
Freshwater
Slough during
low tide.
Photograph
taken 7/18/19.



Photograph D.
East view
upstream of R-
354 Site on
Freshwater
Slough at low
tide. View of
eroded levee
along north bank
(in left of photo)
where installation
of shoreline
stabilization mats
is proposed.
Photograph
taken 7/18/19.



Figure 7
Site Photographs
PG&E Pipeline Maintenance Projects

Photograph E.
West view of
waterside face of
eroded levee at
R-354 Site.
Project proposes
installation of
shoreline
stabilization mats.
Vegetation on top
of levee is wet
meadow and
small pockets of
Spartina occur
along water side
of levee.
Photograph taken
12/11/18.



Photograph F.
West view of top
of levee at R-354
Site in section
proposed for
installation of
shoreline
stabilization mats.
Photograph taken
10/30/18.



Figure 7
Site Photographs
PG&E Pipeline Maintenance Projects

Photograph G.
East view of
meadow area at
R-354 Site
proposed for
staging.
Photograph taken
10/30/18.



Photograph H.
South view of
disturbed area on
south side of
Freshwater
Slough proposed
for excavation of
pipeline to fill with
concrete slurry.
Photograph taken
10/30/18.



Figure 7
Site Photographs
PG&E Pipeline Maintenance Projects

Photograph I.
Southwest view
of pipeline
crossing at R-519
Site on Ryan
Slough at high
tide. Photograph
taken 7/17/19.



Photograph J.
North view of
pipeline crossing
at R-519 Site on
Ryan Slough at
high tide.
Photograph taken
7/17/19.



Figure 7
Site Photographs
PG&E Pipeline Maintenance Projects

Photograph K.
West view of
pipeline crossing
at R-519 Site on
Ryan Slough at
low tide.
Photograph taken
7/17/19.



Photograph L.
Southwest view
of the pipeline
crossing at R-519
Site on Ryan
Slough at low
tide. Photograph
taken 7/17/19.



Figure 7
Site Photographs
PG&E Pipeline Maintenance Projects

Photograph M.
Northeast view of
wet meadow
proposed for
staging location
at R-519 Site.
Photograph taken
10/29/18.



Photograph N.
Southwest view
of sinkhole at RT-
102 Site.
Photograph taken
7/17/2019.



Figure 7
Site Photographs
PG&E Pipeline Maintenance Projects

Photograph O.
Northwest view of
exposed pipeline
in sinkhole at RT-
102 Site.
Photograph taken
10/31/18.



Photograph P.
South view of
Ryan Creek
adjacent to RT-
102 Site in
approximate
location of
proposed culvert
replacement.
Photograph taken
10/31/18.



Figure 7
Site Photographs
PG&E Pipeline Maintenance Projects

Photograph Q.
View of
undersized and
ineffective culvert
currently existing
at the RT-102
Site at the outfall
location. Bank of
Ryan Creek is
severely eroded
in this location.
Photograph taken
10/31/18.



Photograph R.
East view of
eroded bank on
Ryan Creek at
the existing
culvert location.
RT-102 pipeline
maintenance and
sinkhole repair
project proposes
to replace
ineffective culvert
to stop erosion.
Photograph taken
10/31/18.



Figure 7
Site Photographs
PG&E Pipeline Maintenance Projects

Photograph S.
Northwest view of
forested wetland
north of sinkhole
location at RT-
102 Site.
Photograph taken
7/17/19.



Photograph T.
Southwest view
of narrow corridor
of riparian trees
on bank of Ryan
Creek to be
removed at the
RT-102 Site for
pipeline
maintenance,
sinkhole repair,
and culvert
replacement.
Photograph taken
7/17/19.



Figure 7
Site Photographs
PG&E Pipeline Maintenance Projects

Photograph U.
North view of
previously
cleared access
corridor at the
RT-102 Site for.
Photograph taken
10/31/19.



Figure 7
Site Photographs
PG&E Pipeline Maintenance Projects

APPENDIX A

USFWS SPECIES LIST



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Arcata Fish And Wildlife Office

1655 Heindon Road

Arcata, CA 95521-4573

Phone: (707) 822-7201 Fax: (707) 822-8411



In Reply Refer To:

April 22, 2020

Consultation Code: 08EACT00-2019-SLI-0387

Event Code: 08EACT00-2020-E-00533

Project Name: R-354 Pipeline Maintenance Project

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Arcata Fish And Wildlife Office

1655 Heindon Road

Arcata, CA 95521-4573

(707) 822-7201

Project Summary

Consultation Code: 08EACT00-2019-SLI-0387

Event Code: 08EACT00-2020-E-00533

Project Name: R-354 Pipeline Maintenance Project

Project Type: OIL OR GAS

Project Description: PG&E is planning the decommissioning and removal of portions of the previously retired L-137B natural gas pipeline crossing at Freshwater Slough located in Eureka, Humboldt County, California. This site consists primarily of farm and pasture lands used for livestock grazing. Freshwater Slough, a tidal slough, bisects the study area, and the pipeline planned for decommissioning crosses the slough. The L-137B crossing consists of a retired 8-inch nominal steel pipeline that is buried through the south bank and across the slough but rises out of the slough at the north bank and is exposed near the waterline on the north bank where it terminates. This pipeline segment will be pigged and flushed, filled with cement, and the exposed end at the north bank removed to a depth of approximately 5-feet below existing slough bed elevations. A remnant of this pipeline, presently disconnected from the crossing, passes through a levee that forms the north bank. This pipeline segment will be removed through the levee and across the field behind the levee for approximately 50 feet. A concrete slab that is a remnant of a concrete cutoff wall (anti-seepage wall) that was located in the levee and associated with the pipeline crossing will also be removed as part of the decommissioning project. Additionally, shoreline stabilization mats are proposed for placement along the north levee to slow the erosion of the north bank, and a sink hole located behind the north abutment of a private bridge at the site (Christie Bridge) will be filled with cement slurry to slow erosion at the bridge abutment.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/40.7960931040991N124.11967932665547W>



Counties: Humboldt, CA

Endangered Species Act Species

There is a total of 7 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [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.

Mammals

NAME	STATUS
Fisher <i>Pekania pennanti</i> Population: West coast DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3651	Proposed Threatened

Birds

NAME	STATUS
Marbled Murrelet <i>Brachyramphus marmoratus</i> Population: U.S.A. (CA, OR, WA) There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4467	Threatened
Northern Spotted Owl <i>Strix occidentalis caurina</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened
Western Snowy Plover <i>Charadrius nivosus nivosus</i> Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened
Yellow-billed Cuckoo <i>Coccyzus americanus</i> Population: Western U.S. DPS There is proposed critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Fishes

NAME	STATUS
Tidewater Goby <i>Eucyclogobius newberryi</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/57	Endangered

Flowering Plants

NAME	STATUS
Western Lily <i>Lilium occidentale</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/998	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Arcata Fish And Wildlife Office

1655 Heindon Road

Arcata, CA 95521-4573

Phone: (707) 822-7201 Fax: (707) 822-8411



In Reply Refer To:

April 22, 2020

Consultation Code: 08EACT00-2019-SLI-0386

Event Code: 08EACT00-2020-E-00534

Project Name: R-519 (L-137C) Pipeline Maintenance Project

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Arcata Fish And Wildlife Office

1655 Heindon Road

Arcata, CA 95521-4573

(707) 822-7201

Project Summary

Consultation Code: 08EACT00-2019-SLI-0386

Event Code: 08EACT00-2020-E-00534

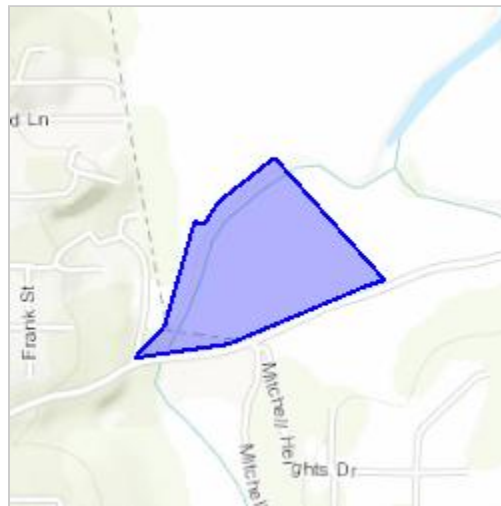
Project Name: R-519 (L-137C) Pipeline Maintenance Project

Project Type: OIL OR GAS

Project Description: PG&E is planning the replacement of the L137C gas pipeline crossing at Ryan Slough located just north of Myrtle Avenue near Eureka, Humboldt County, California. This site consists primarily of farm and pasture lands used for livestock grazing. Ryan Slough, a tidal slough, is located within the northwestern edge of the study area, and the pipeline planned for replacement crosses Ryan Slough just north of Myrtle Avenue. The L-137C crossing consists of a 4-inch nominal steel pipeline that crosses the slough and is exposed at the surface in the slough crossing. Replacement of this pipeline crossing using jack and bore methodology is proposed to minimize disturbance in the slough. Bore holes used for installation will be sited in upland and disturbed portions of the site. Once the pipeline replacement is installed and tie-ins are complete, the exposed portion of the pipeline will be removed from Ryan Slough.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/40.78667376916859N124.11788660427854W>



Counties: Humboldt, CA

Endangered Species Act Species

There is a total of 7 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [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.

Mammals

NAME	STATUS
Fisher <i>Pekania pennanti</i> Population: West coast DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3651	Proposed Threatened

Birds

NAME	STATUS
Marbled Murrelet <i>Brachyramphus marmoratus</i> Population: U.S.A. (CA, OR, WA) There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4467	Threatened
Northern Spotted Owl <i>Strix occidentalis caurina</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened
Western Snowy Plover <i>Charadrius nivosus nivosus</i> Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened
Yellow-billed Cuckoo <i>Coccyzus americanus</i> Population: Western U.S. DPS There is proposed critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Fishes

NAME	STATUS
Tidewater Goby <i>Eucyclogobius newberryi</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/57	Endangered

Flowering Plants

NAME	STATUS
Western Lily <i>Lilium occidentale</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/998	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.



United States Department of the Interior

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In Reply Refer To:

April 22, 2020

Consultation Code: 08EACT00-2019-SLI-0385

Event Code: 08EACT00-2020-E-00535

Project Name: RT-102 Pipeline Maintenance Project

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Arcata Fish And Wildlife Office

1655 Heindon Road

Arcata, CA 95521-4573

(707) 822-7201

Project Summary

Consultation Code: 08EACT00-2019-SLI-0385

Event Code: 08EACT00-2020-E-00535

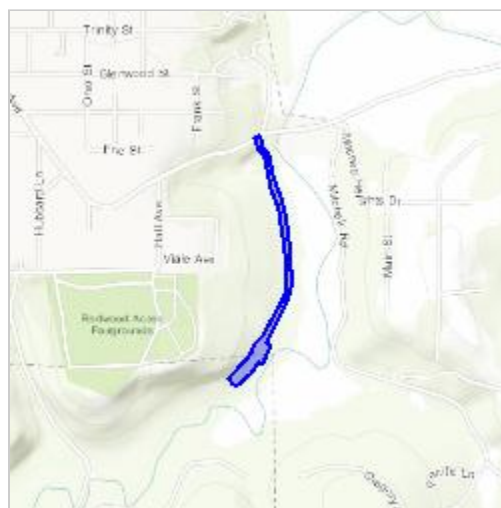
Project Name: RT-102 Pipeline Maintenance Project

Project Type: OIL OR GAS

Project Description: PG&E is planning the remediation of erosional issues resulting from water flow across an earth berm parallel to the west bank of Ryan Creek in which the pipeline is buried. Erosion has created three sinkholes that have exposed a segment of the natural gas pipeline L-177A approximately 0.5-mile south of Myrtle Avenue near Ryan Creek, within property that was previously owned by the Green Diamond Resource Company but was purchased by Humboldt County in 2014 and is now known as the McKay Community Forest. The L-177A pipeline alignment follows a retired railroad berm that was built on top of a redwood timber roadway. Ryan Creek, a perennial drainage, occurs approximately 50 feet from the sinkhole location. Proposed work associated with the remediation will involve terrestrial excavation and reconstruction of the railroad berm at the sink hole locations, removal of the underlying redwood timber roadway causing the subsurface water flow and undercutting, pipeline corrosion repair, backfill of the excavated area with engineered fill, and surface drainage improvements.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/40.78084597607758N124.12034664955002W>



Counties: Humboldt, CA

Endangered Species Act Species

There is a total of 7 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [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.

Mammals

NAME	STATUS
Fisher <i>Pekania pennanti</i> Population: West coast DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3651	Proposed Threatened

Birds

NAME	STATUS
Marbled Murrelet <i>Brachyramphus marmoratus</i> Population: U.S.A. (CA, OR, WA) There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4467	Threatened
Northern Spotted Owl <i>Strix occidentalis caurina</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened
Western Snowy Plover <i>Charadrius nivosus nivosus</i> Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened
Yellow-billed Cuckoo <i>Coccyzus americanus</i> Population: Western U.S. DPS There is proposed critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Fishes

NAME	STATUS
Tidewater Goby <i>Eucyclogobius newberryi</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/57	Endangered

Flowering Plants

NAME	STATUS
Western Lily <i>Lilium occidentale</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/998	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

APPENDIX B

CNDDDB QUERY RESULTS



Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database



Query Criteria: BIOS selection R-354 Site 5-Mile Radius

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Abronia umbellata var. breviflora</i> pink sand-verbena	G4G5T2 S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_RSABG-Rancho Santa Ana Botanic Garden	5 20	61 S:4	0	3	0	0	0	1	1	3	4	0	0
<i>Acipenser medirostris</i> green sturgeon	G3 S1S2	Threatened None	AFS_VU-Vulnerable CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened NMFS_SC-Species of Concern	0 0	1 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Anodonta californiensis</i> California floater	G3Q S2?	None None	USFS_S-Sensitive	41 41	6 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Aplodontia rufa humboldtiana</i> Humboldt mountain beaver	G5TNR SNR	None None		100 200	28 S:3	0	0	0	0	0	3	3	0	3	0	0
<i>Ardea alba</i> great egret	G5 S4	None None	CDF_S-Sensitive IUCN_LC-Least Concern	4 10	43 S:2	0	0	0	0	0	2	1	1	2	0	0
<i>Ardea herodias</i> great blue heron	G5 S4	None None	CDF_S-Sensitive IUCN_LC-Least Concern	4 10	155 S:2	0	0	0	0	0	2	1	1	2	0	0
<i>Ascaphus truei</i> Pacific tailed frog	G4 S3S4	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	100 300	491 S:3	0	0	0	0	0	3	2	1	3	0	0
<i>Astragalus pycnostachyus var. pycnostachyus</i> coastal marsh milk-vetch	G2T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_RSABG-Rancho Santa Ana Botanic Garden SB_SBBG-Santa Barbara Botanic Garden SB_UCBG-UC Botanical Garden at Berkeley		25 S:1	0	0	0	0	0	1	1	0	1	0	0



Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database



Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Bombus caliginosus</i> obscure bumble bee	G4? S1S2	None None	IUCN_VU-Vulnerable	50 100	181 S:3	0	0	0	0	0	3	3	0	3	0	0
<i>Bombus occidentalis</i> western bumble bee	G2G3 S1	None Candidate Endangered	USFS_S-Sensitive XERCES_IM-Imperiled	15 100	279 S:4	0	0	0	0	0	4	4	0	4	0	0
<i>Bryoria spiralifera</i> twisted horsehair lichen	G1G2 S1S2	None None	Rare Plant Rank - 1B.1	30 30	8 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Cardamine angulata</i> seaside bittercress	G4G5 S3	None None	Rare Plant Rank - 2B.1	310 310	38 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Carex arcta</i> northern clustered sedge	G5 S1	None None	Rare Plant Rank - 2B.2	500 500	13 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Carex lyngbyei</i> Lyngbye's sedge	G5 S3	None None	Rare Plant Rank - 2B.2	3 10	29 S:11	1	3	3	0	0	4	4	7	11	0	0
<i>Carex praticola</i> northern meadow sedge	G5 S2	None None	Rare Plant Rank - 2B.2		14 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Castilleja ambigua</i> var. <i>humboldtensis</i> Humboldt Bay owl's-clover	G4T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	5 10	31 S:13	1	5	2	0	0	5	4	9	13	0	0
<i>Castilleja litoralis</i> Oregon coast paintbrush	G3 S3	None None	Rare Plant Rank - 2B.2	500 500	44 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Charadrius alexandrinus nivosus</i> western snowy plover	G3T3 S2S3	Threatened None	CDFW_SSC-Species of Special Concern NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	10 23	138 S:2	0	0	0	0	0	2	1	1	2	0	0
<i>Charadrius montanus</i> mountain plover	G3 S2S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	7 7	90 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Chloropyron maritimum</i> ssp. <i>palustre</i> Point Reyes salty bird's-beak	G4?T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	5 8	76 S:11	1	4	1	1	0	4	3	8	11	0	0



Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database



Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Cicindela hirticollis gravida</i> sandy beach tiger beetle	G5T2 S2	None None		10 10	34 S:1	0	0	0	0	1	0	1	0	0	0	1
<i>Circus hudsonius</i> northern harrier	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	6 6	53 S:1	0	0	1	0	0	0	0	1	1	0	0
<i>Collinsia corymbosa</i> round-headed Chinese-houses	G1 S1	None None	Rare Plant Rank - 1B.2		13 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	G3G4 S2	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive WBWG_H-High Priority	30 30	635 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Coturnicops noveboracensis</i> yellow rail	G4 S1S2	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern NABCI_RWL-Red Watch List USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	4 24	45 S:3	0	0	0	0	0	3	2	1	3	0	0
<i>Egretta thula</i> snowy egret	G5 S4	None None	IUCN_LC-Least Concern	4 10	20 S:2	0	0	0	0	0	2	1	1	2	0	0
<i>Elanus leucurus</i> white-tailed kite	G5 S3S4	None None	BLM_S-Sensitive CDFW_FP-Fully Protected IUCN_LC-Least Concern	60 60	180 S:2	0	0	0	0	0	2	0	2	2	0	0
<i>Emys marmorata</i> western pond turtle	G3G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable USFS_S-Sensitive	17 32	1385 S:2	0	1	1	0	0	0	0	2	2	0	0
<i>Entosphenus tridentatus</i> Pacific lamprey	G4 S4	None None	AFS_VU-Vulnerable BLM_S-Sensitive CDFW_SSC-Species of Special Concern USFS_S-Sensitive	24 43	9 S:4	0	0	0	0	0	4	1	3	4	0	0



Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database



Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Erethizon dorsatum</i> North American porcupine	G5 S3	None None	IUCN_LC-Least Concern	19 24	523 S:2	0	0	0	0	0	2	1	1	2	0	0
<i>Erysimum menziesii</i> Menzies' wallflower	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden SB_UCBG-UC Botanical Garden at Berkeley	5 30	19 S:3	0	2	1	0	0	0	0	3	3	0	0
<i>Erythronium revolutum</i> coast fawn lily	G4G5 S3	None None	Rare Plant Rank - 2B.2		164 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Eucyclogobius newberryi</i> tidewater goby	G3 S3	Endangered None	AFS_EN-Endangered CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable	0 12	127 S:6	0	0	0	0	0	6	1	5	6	0	0
<i>Fissidens pauperculus</i> minute pocket moss	G3? S2	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive	100 100	22 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Gilia capitata ssp. pacifica</i> Pacific gilia	G5T3 S2	None None	Rare Plant Rank - 1B.2	250 250	83 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Gilia millefoliata</i> dark-eyed gilia	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	5 36	54 S:7	0	3	1	0	0	3	3	4	7	0	0
<i>Hesperevax sparsiflora var. brevifolia</i> short-leaved evax	G4T3 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	10 10	56 S:2	0	0	0	0	0	2	2	0	2	0	0
<i>Lampetra richardsoni</i> western brook lamprey	G4G5 S3S4	None None	CDFW_SSC-Species of Special Concern USFS_S-Sensitive	35 35	4 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Lasthenia californica ssp. macrantha</i> perennial goldfields	G3T2 S2	None None	Rare Plant Rank - 1B.2		59 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Lathyrus japonicus</i> seaside pea	G5 S2	None None	Rare Plant Rank - 2B.1	5 200	24 S:2	0	0	0	0	0	2	2	0	2	0	0
<i>Lathyrus palustris</i> marsh pea	G5 S2	None None	Rare Plant Rank - 2B.2	10 10	13 S:2	0	0	0	0	0	2	1	1	2	0	0



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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Layia carnosa beach layia	G2 S2	Endangered Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden SB_SBBG-Santa Barbara Botanic Garden	10 40	25 S:3	0	3	0	0	0	0	1	2	3	0	0
Lilium occidentale western lily	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_BerrySB-Berry Seed Bank	30 350	16 S:7	0	2	0	1	3	1	3	4	4	3	0
Lycopodium clavatum running-pine	G5 S3	None None	Rare Plant Rank - 4.1	180 1,000	120 S:4	0	3	0	0	0	1	1	3	4	0	0
Monotropa uniflora ghost-pipe	G5 S2	None None	Rare Plant Rank - 2B.2	100 100	100 S:1	0	0	0	0	0	1	1	0	1	0	0
Montia howellii Howell's montia	G3G4 S2	None None	Rare Plant Rank - 2B.2	50 700	114 S:5	0	0	0	1	3	1	2	3	2	3	0
Myotis evotis long-eared myotis	G5 S3	None None	BLM_S-Sensitive IUCN_LC-Least Concern WBWG_M-Medium Priority	40 40	139 S:1	0	1	0	0	0	0	1	0	1	0	0
Northern Coastal Salt Marsh Northern Coastal Salt Marsh	G3 S3.2	None None		0 0	53 S:7	1	0	0	0	0	6	7	0	7	0	0
Nycticorax nycticorax black-crowned night heron	G5 S4	None None	IUCN_LC-Least Concern	4 150	37 S:4	0	0	0	0	0	4	3	1	4	0	0
Oenothera wolfii Wolf's evening-primrose	G2 S1	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_BerrySB-Berry Seed Bank	10 10	29 S:1	0	0	0	0	0	1	0	1	1	0	0
Oncorhynchus clarkii clarkii coast cutthroat trout	G4T4 S3	None None	AFS_VU-Vulnerable CDFW_SSC-Species of Special Concern USFS_S-Sensitive	5 117	45 S:8	0	0	1	0	0	7	3	5	8	0	0
Oncorhynchus kisutch pop. 2 coho salmon - southern Oregon / northern California ESU	G4T2Q S2?	Threatened Threatened	AFS_TH-Threatened	35 117	10 S:4	0	0	2	0	0	2	0	4	4	0	0
Oncorhynchus mykiss irideus pop. 16 steelhead - northern California DPS	G5T2T3Q S2S3	Threatened None	AFS_TH-Threatened	35 117	12 S:3	0	1	1	0	0	1	0	3	3	0	0



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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Pandion haliaetus</i> osprey	G5 S4	None None	CDF_S-Sensitive CDFW_WL-Watch List IUCN_LC-Least Concern	10 880	504 S:21	2	10	3	0	0	6	18	3	21	0	0
<i>Phalacrocorax auritus</i> double-crested cormorant	G5 S4	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	10 10	39 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Rallus obsoletus obsoletus</i> California Ridgway's rail	G5T1 S1	Endangered Endangered	CDFW_FP-Fully Protected NABCI_RWL-Red Watch List		99 S:1	0	0	0	0	1	0	1	0	0	0	1
<i>Rana aurora</i> northern red-legged frog	G4 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	4 600	292 S:24	0	2	0	0	0	22	4	20	24	0	0
<i>Rana boylei</i> foothill yellow-legged frog	G3 S3	None Candidate Threatened	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened USFS_S-Sensitive	36 36	2468 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Rhyacotriton variegatus</i> southern torrent salamander	G3G4 S2S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	300 800	416 S:3	0	0	1	0	0	2	0	3	3	0	0
<i>Riparia riparia</i> bank swallow	G5 S2	None Threatened	BLM_S-Sensitive IUCN_LC-Least Concern	50 50	298 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Sidalcea malachroides</i> maple-leaved checkerbloom	G3 S3	None None	Rare Plant Rank - 4.2	100 700	136 S:9	1	1	1	4	0	2	4	5	9	0	0
<i>Sidalcea malviflora ssp. patula</i> Siskiyou checkerbloom	G5T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	50 50	53 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Sidalcea oregana ssp. eximia</i> coast checkerbloom	G5T1 S1	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	100 100	19 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Silene scouleri ssp. scouleri</i> Scouler's catchfly	G5T4T5 S2S3	None None	Rare Plant Rank - 2B.2		23 S:1	0	0	0	0	0	1	1	0	1	0	0



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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Spergularia canadensis</i> var. <i>occidentalis</i> western sand-spurrey	G5T4 S1	None None	Rare Plant Rank - 2B.1	5 10	4 S:3	0	0	1	0	0	2	2	1	3	0	0
<i>Spirinchus thaleichthys</i> longfin smelt	G5 S1	Candidate Threatened		0 0	46 S:3	0	0	0	0	0	3	2	1	3	0	0
<i>Thaleichthys pacificus</i> eulachon	G5 S3	Threatened None			10 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Viola palustris</i> alpine marsh violet	G5 S1S2	None None	Rare Plant Rank - 2B.2	100 100	10 S:2	0	0	0	0	0	2	2	0	2	0	0



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Query Criteria: BIOS selection R-519 Site 5-Mile Radius

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Abronia umbellata</i> var. <i>breviflora</i> pink sand-verbena	G4G5T2 S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_RSABG-Rancho Santa Ana Botanic Garden	5 20	61 S:3	0	2	0	0	0	1	1	2	3	0	0
<i>Acipenser medirostris</i> green sturgeon	G3 S1S2	Threatened None	AFS_VU-Vulnerable CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened NMFS_SC-Species of Concern	0 0	1 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Anodonta californiensis</i> California floater	G3Q S2?	None None	USFS_S-Sensitive	41 41	6 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Aplodontia rufa humboldtiana</i> Humboldt mountain beaver	G5TNR SNR	None None		100 200	28 S:2	0	0	0	0	0	2	2	0	2	0	0
<i>Ardea alba</i> great egret	G5 S4	None None	CDF_S-Sensitive IUCN_LC-Least Concern	4 10	43 S:2	0	0	0	0	0	2	1	1	2	0	0
<i>Ardea herodias</i> great blue heron	G5 S4	None None	CDF_S-Sensitive IUCN_LC-Least Concern	4 10	155 S:2	0	0	0	0	0	2	1	1	2	0	0
<i>Ascaphus truei</i> Pacific tailed frog	G4 S3S4	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	100 300	491 S:3	0	0	0	0	0	3	2	1	3	0	0
<i>Astragalus pycnostachyus</i> var. <i>pycnostachyus</i> coastal marsh milk-vetch	G2T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_RSABG-Rancho Santa Ana Botanic Garden SB_SBBG-Santa Barbara Botanic Garden SB_UCBG-UC Botanical Garden at Berkeley		25 S:1	0	0	0	0	0	1	1	0	1	0	0



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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Bombus caliginosus</i> obscure bumble bee	G4? S1S2	None None	IUCN_VU-Vulnerable	50 100	181 S:2	0	0	0	0	0	2	2	0	2	0	0
<i>Bombus occidentalis</i> western bumble bee	G2G3 S1	None Candidate Endangered	USFS_S-Sensitive XERCES_IM-Imperiled	15 50	279 S:3	0	0	0	0	0	3	3	0	3	0	0
<i>Bryoria spiralifera</i> twisted horsehair lichen	G1G2 S1S2	None None	Rare Plant Rank - 1B.1	30 30	8 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Cardamine angulata</i> seaside bittercress	G4G5 S3	None None	Rare Plant Rank - 2B.1	310 310	38 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Carex arcta</i> northern clustered sedge	G5 S1	None None	Rare Plant Rank - 2B.2	500 500	13 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Carex lyngbyei</i> Lyngbye's sedge	G5 S3	None None	Rare Plant Rank - 2B.2	3 10	29 S:9	1	3	3	0	0	2	2	7	9	0	0
<i>Carex praticola</i> northern meadow sedge	G5 S2	None None	Rare Plant Rank - 2B.2		14 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Castilleja ambigua var. humboldtiensis</i> Humboldt Bay owl's-clover	G4T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	5 10	31 S:13	1	5	2	0	0	5	4	9	13	0	0
<i>Castilleja litoralis</i> Oregon coast paintbrush	G3 S3	None None	Rare Plant Rank - 2B.2	500 500	44 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Charadrius alexandrinus nivosus</i> western snowy plover	G3T3 S2S3	Threatened None	CDFW_SSC-Species of Special Concern NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	10 23	138 S:2	0	0	0	0	0	2	1	1	2	0	0
<i>Charadrius montanus</i> mountain plover	G3 S2S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	7 7	90 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Chloropyron maritimum ssp. palustre</i> Point Reyes salty bird's-beak	G4?T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	5 8	76 S:10	1	4	1	0	0	4	2	8	10	0	0



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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Cicindela hirticollis gravida</i> sandy beach tiger beetle	G5T2 S2	None None		10 10	34 S:1	0	0	0	0	1	0	1	0	0	0	1
<i>Circus hudsonius</i> northern harrier	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	6 6	53 S:1	0	0	1	0	0	0	0	1	1	0	0
<i>Collinsia corymbosa</i> round-headed Chinese-houses	G1 S1	None None	Rare Plant Rank - 1B.2		13 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	G3G4 S2	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive WBWG_H-High Priority	30 30	635 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Coturnicops noveboracensis</i> yellow rail	G4 S1S2	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern NABCI_RWL-Red Watch List USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	4 24	45 S:3	0	0	0	0	0	3	2	1	3	0	0
<i>Egretta thula</i> snowy egret	G5 S4	None None	IUCN_LC-Least Concern	4 10	20 S:2	0	0	0	0	0	2	1	1	2	0	0
<i>Elanus leucurus</i> white-tailed kite	G5 S3S4	None None	BLM_S-Sensitive CDFW_FP-Fully Protected IUCN_LC-Least Concern	60 60	180 S:2	0	0	0	0	0	2	0	2	2	0	0
<i>Emys marmorata</i> western pond turtle	G3G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable USFS_S-Sensitive	17 32	1385 S:2	0	1	1	0	0	0	0	2	2	0	0
<i>Entosphenus tridentatus</i> Pacific lamprey	G4 S4	None None	AFS_VU-Vulnerable BLM_S-Sensitive CDFW_SSC-Species of Special Concern USFS_S-Sensitive	24 42	9 S:3	0	0	0	0	0	3	0	3	3	0	0



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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Erethizon dorsatum</i> North American porcupine	G5 S3	None None	IUCN_LC-Least Concern	19 685	523 S:3	0	0	0	0	0	3	1	2	3	0	0
<i>Erysimum menziesii</i> Menzies' wallflower	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden SB_UCBG-UC Botanical Garden at Berkeley	5 20	19 S:2	0	1	1	0	0	0	0	2	2	0	0
<i>Erythronium revolutum</i> coast fawn lily	G4G5 S3	None None	Rare Plant Rank - 2B.2		164 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Eucyclogobius newberryi</i> tidewater goby	G3 S3	Endangered None	AFS_EN-Endangered CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable	0 12	127 S:5	0	0	0	0	0	5	1	4	5	0	0
<i>Fissidens pauperculus</i> minute pocket moss	G3? S2	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive	100 100	22 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Gilia capitata ssp. pacifica</i> Pacific gilia	G5T3 S2	None None	Rare Plant Rank - 1B.2	250 250	83 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Gilia millefoliata</i> dark-eyed gilia	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	5 36	54 S:6	0	2	1	0	0	3	3	3	6	0	0
<i>Hesperevax sparsiflora var. brevifolia</i> short-leaved evax	G4T3 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	10 10	56 S:2	0	0	0	0	0	2	2	0	2	0	0
<i>Lampetra richardsoni</i> western brook lamprey	G4G5 S3S4	None None	CDFW_SSC-Species of Special Concern USFS_S-Sensitive	35 35	4 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Lasthenia californica ssp. macrantha</i> perennial goldfields	G3T2 S2	None None	Rare Plant Rank - 1B.2		59 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Lathyrus japonicus</i> seaside pea	G5 S2	None None	Rare Plant Rank - 2B.1	5 200	24 S:2	0	0	0	0	0	2	2	0	2	0	0
<i>Lathyrus palustris</i> marsh pea	G5 S2	None None	Rare Plant Rank - 2B.2	10 10	13 S:2	0	0	0	0	0	2	1	1	2	0	0



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<i>Layia carnosa</i> beach layia	G2 S2	Endangered Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden SB_SBBG-Santa Barbara Botanic Garden	10 40	25 S:3	0	3	0	0	0	0	1	2	3	0	0
<i>Lilium occidentale</i> western lily	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_BerrySB-Berry Seed Bank	30 350	16 S:7	0	2	0	1	3	1	3	4	4	3	0
<i>Lycopodium clavatum</i> running-pine	G5 S3	None None	Rare Plant Rank - 4.1	180 1,000	120 S:4	0	3	0	0	0	1	1	3	4	0	0
<i>Monotropa uniflora</i> ghost-pipe	G5 S2	None None	Rare Plant Rank - 2B.2	100 100	100 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Montia howellii</i> Howell's montia	G3G4 S2	None None	Rare Plant Rank - 2B.2	50 700	114 S:5	0	0	0	1	3	1	2	3	2	3	0
<i>Myotis evotis</i> long-eared myotis	G5 S3	None None	BLM_S-Sensitive IUCN_LC-Least Concern WBWG_M-Medium Priority	40 40	139 S:1	0	1	0	0	0	0	1	0	1	0	0
<i>Northern Coastal Salt Marsh</i> Northern Coastal Salt Marsh	G3 S3.2	None None			53 S:6	0	0	0	0	0	6	6	0	6	0	0
<i>Nycticorax nycticorax</i> black-crowned night heron	G5 S4	None None	IUCN_LC-Least Concern	4 150	37 S:4	0	0	0	0	0	4	3	1	4	0	0
<i>Oenothera wolfii</i> Wolf's evening-primrose	G2 S1	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_BerrySB-Berry Seed Bank	10 10	29 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Oncorhynchus clarkii clarkii</i> coast cutthroat trout	G4T4 S3	None None	AFS_VU-Vulnerable CDFW_SSC-Species of Special Concern USFS_S-Sensitive	5 117	45 S:7	0	0	1	0	0	6	2	5	7	0	0
<i>Oncorhynchus kisutch pop. 2</i> coho salmon - southern Oregon / northern California ESU	G4T2Q S2?	Threatened Threatened	AFS_TH-Threatened	35 117	10 S:3	0	0	1	0	0	2	0	3	3	0	0
<i>Oncorhynchus mykiss irideus pop. 16</i> steelhead - northern California DPS	G5T2T3Q S2S3	Threatened None	AFS_TH-Threatened	35 117	12 S:3	0	1	1	0	0	1	0	3	3	0	0



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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Pandion haliaetus</i> osprey	G5 S4	None None	CDF_S-Sensitive CDFW_WL-Watch List IUCN_LC-Least Concern	10 880	504 S:20	2	10	3	0	0	5	17	3	20	0	0
<i>Phalacrocorax auritus</i> double-crested cormorant	G5 S4	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	10 10	39 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Rallus obsoletus obsoletus</i> California Ridgway's rail	G5T1 S1	Endangered Endangered	CDFW_FP-Fully Protected NABCI_RWL-Red Watch List		99 S:1	0	0	0	0	1	0	1	0	0	0	1
<i>Rana aurora</i> northern red-legged frog	G4 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	4 600	292 S:21	0	1	0	0	0	20	3	18	21	0	0
<i>Rana boylei</i> foothill yellow-legged frog	G3 S3	None Candidate Threatened	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened USFS_S-Sensitive	36 36	2468 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Rhyacotriton variegatus</i> southern torrent salamander	G3G4 S2S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	300 800	416 S:3	0	0	1	0	0	2	0	3	3	0	0
<i>Riparia riparia</i> bank swallow	G5 S2	None Threatened	BLM_S-Sensitive IUCN_LC-Least Concern	50 50	298 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Sidalcea malachroides</i> maple-leaved checkerbloom	G3 S3	None None	Rare Plant Rank - 4.2	100 700	136 S:9	1	1	1	4	0	2	4	5	9	0	0
<i>Sidalcea malviflora ssp. patula</i> Siskiyou checkerbloom	G5T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	50 50	53 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Sidalcea oregana ssp. eximia</i> coast checkerbloom	G5T1 S1	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	100 100	19 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Silene scouleri ssp. scouleri</i> Scouler's catchfly	G5T4T5 S2S3	None None	Rare Plant Rank - 2B.2		23 S:1	0	0	0	0	0	1	1	0	1	0	0



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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Spergularia canadensis</i> var. <i>occidentalis</i> western sand-spurrey	G5T4 S1	None None	Rare Plant Rank - 2B.1	5 10	4 S:3	0	0	1	0	0	2	2	1	3	0	0
<i>Spirinchus thaleichthys</i> longfin smelt	G5 S1	Candidate Threatened		0 0	46 S:3	0	0	0	0	0	3	2	1	3	0	0
<i>Thaleichthys pacificus</i> eulachon	G5 S3	Threatened None			10 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Viola palustris</i> alpine marsh violet	G5 S1S2	None None	Rare Plant Rank - 2B.2	100 100	10 S:2	0	0	0	0	0	2	2	0	2	0	0



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Query Criteria: BIOS selection RT-102 Site 5-Mile Radius

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Abronia umbellata var. breviflora</i> pink sand-verbena	G4G5T2 S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_RSABG-Rancho Santa Ana Botanic Garden	5 20	61 S:3	0	2	0	0	0	1	1	2	3	0	0
<i>Acipenser medirostris</i> green sturgeon	G3 S1S2	Threatened None	AFS_VU-Vulnerable CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened NMFS_SC-Species of Concern	0 0	1 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Anodonta californiensis</i> California floater	G3Q S2?	None None	USFS_S-Sensitive	41 41	6 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Aplodontia rufa humboldtiana</i> Humboldt mountain beaver	G5TNR SNR	None None		100 200	28 S:2	0	0	0	0	0	2	2	0	2	0	0
<i>Arborimus pomo</i> Sonoma tree vole	G3 S3	None None	CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened	40 40	222 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Ardea alba</i> great egret	G5 S4	None None	CDF_S-Sensitive IUCN_LC-Least Concern	4 10	43 S:2	0	0	0	0	0	2	1	1	2	0	0
<i>Ardea herodias</i> great blue heron	G5 S4	None None	CDF_S-Sensitive IUCN_LC-Least Concern	4 10	155 S:2	0	0	0	0	0	2	1	1	2	0	0
<i>Ascaphus truei</i> Pacific tailed frog	G4 S3S4	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	100 300	491 S:3	0	0	0	0	0	3	2	1	3	0	0



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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Astragalus pycnostachyus</i> var. <i>pycnostachyus</i> coastal marsh milk-vetch	G2T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_RSABG-Rancho Santa Ana Botanic Garden SB_SBBG-Santa Barbara Botanic Garden SB_UCBG-UC Botanical Garden at Berkeley		25 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Bombus caliginosus</i> obscure bumble bee	G4? S1S2	None None	IUCN_VU-Vulnerable	50 100	181 S:2	0	0	0	0	0	2	2	0	2	0	0
<i>Bombus occidentalis</i> western bumble bee	G2G3 S1	None Candidate Endangered	USFS_S-Sensitive XERCES_IM-Imperiled	15 50	279 S:3	0	0	0	0	0	3	3	0	3	0	0
<i>Bryoria spiralifera</i> twisted horsehair lichen	G1G2 S1S2	None None	Rare Plant Rank - 1B.1	30 30	8 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Cardamine angulata</i> seaside bittercress	G4G5 S3	None None	Rare Plant Rank - 2B.1	310 310	38 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Carex arcta</i> northern clustered sedge	G5 S1	None None	Rare Plant Rank - 2B.2	500 500	13 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Carex lyngbyei</i> Lyngbye's sedge	G5 S3	None None	Rare Plant Rank - 2B.2	3 10	29 S:9	1	3	3	0	0	2	2	7	9	0	0
<i>Carex praticola</i> northern meadow sedge	G5 S2	None None	Rare Plant Rank - 2B.2		14 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Castilleja ambigua</i> var. <i>humboldtensis</i> Humboldt Bay owl's-clover	G4T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	5 10	31 S:13	1	5	2	0	0	5	4	9	13	0	0
<i>Castilleja litoralis</i> Oregon coast paintbrush	G3 S3	None None	Rare Plant Rank - 2B.2	500 500	44 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Charadrius alexandrinus nivosus</i> western snowy plover	G3T3 S2S3	Threatened None	CDFW_SSC-Species of Special Concern NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	10 23	138 S:2	0	0	0	0	0	2	1	1	2	0	0



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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Charadrius montanus</i> mountain plover	G3 S2S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	7 7	90 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Chloropyron maritimum ssp. palustre</i> Point Reyes salty bird's-beak	G4?T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	5 8	76 S:10	1	4	1	0	0	4	2	8	10	0	0
<i>Cicindela hirticollis grvida</i> sandy beach tiger beetle	G5T2 S2	None None		10 10	34 S:1	0	0	0	0	1	0	1	0	0	0	1
<i>Circus hudsonius</i> northern harrier	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	6 6	53 S:1	0	0	1	0	0	0	0	1	1	0	0
<i>Collinsia corymbosa</i> round-headed Chinese-houses	G1 S1	None None	Rare Plant Rank - 1B.2		13 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	G3G4 S2	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive WBWG_H-High Priority	30 30	635 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Coturnicops noveboracensis</i> yellow rail	G4 S1S2	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern NABCI_RWL-Red Watch List USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	4 24	45 S:3	0	0	0	0	0	3	2	1	3	0	0
<i>Egretta thula</i> snowy egret	G5 S4	None None	IUCN_LC-Least Concern	4 10	20 S:2	0	0	0	0	0	2	1	1	2	0	0



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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Elanus leucurus</i> white-tailed kite	G5 S3S4	None None	BLM_S-Sensitive CDFW_FP-Fully Protected IUCN_LC-Least Concern	60 60	180 S:2	0	0	0	0	0	2	0	2	2	0	0
<i>Emys marmorata</i> western pond turtle	G3G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable USFS_S-Sensitive	17 32	1385 S:2	0	1	1	0	0	0	0	2	2	0	0
<i>Entosphenus tridentatus</i> Pacific lamprey	G4 S4	None None	AFS_VU-Vulnerable BLM_S-Sensitive CDFW_SSC-Species of Special Concern USFS_S-Sensitive	24 42	9 S:3	0	0	0	0	0	3	0	3	3	0	0
<i>Erethizon dorsatum</i> North American porcupine	G5 S3	None None	IUCN_LC-Least Concern	19 685	523 S:3	0	0	0	0	0	3	1	2	3	0	0
<i>Erysimum menziesii</i> Menzies' wallflower	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden SB_UCBG-UC Botanical Garden at Berkeley	5 20	19 S:2	0	1	1	0	0	0	0	2	2	0	0
<i>Erythronium revolutum</i> coast fawn lily	G4G5 S3	None None	Rare Plant Rank - 2B.2		164 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Eucyclogobius newberryi</i> tidewater goby	G3 S3	Endangered None	AFS_EN-Endangered CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable	0 12	127 S:5	0	0	0	0	0	5	1	4	5	0	0
<i>Fissidens pauperculus</i> minute pocket moss	G3? S2	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive	100 100	22 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Gilia capitata ssp. pacifica</i> Pacific gilia	G5T3 S2	None None	Rare Plant Rank - 1B.2	250 250	83 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Gilia millefoliata</i> dark-eyed gilia	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	5 20	54 S:5	0	2	1	0	0	2	3	2	5	0	0
<i>Hesperervax sparsiflora var. brevifolia</i> short-leaved evax	G4T3 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	10 10	56 S:2	0	0	0	0	0	2	2	0	2	0	0



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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Lampetra richardsoni</i> western brook lamprey	G4G5 S3S4	None None	CDFW_SSC-Species of Special Concern USFS_S-Sensitive	35 35	4 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Lasthenia californica ssp. macrantha</i> perennial goldfields	G3T2 S2	None None	Rare Plant Rank - 1B.2		59 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Lathyrus japonicus</i> seaside pea	G5 S2	None None	Rare Plant Rank - 2B.1	5 200	24 S:2	0	0	0	0	0	2	2	0	2	0	0
<i>Lathyrus palustris</i> marsh pea	G5 S2	None None	Rare Plant Rank - 2B.2	10 10	13 S:2	0	0	0	0	0	2	1	1	2	0	0
<i>Layia carnosa</i> beach layia	G2 S2	Endangered Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden SB_SBBG-Santa Barbara Botanic Garden	10 40	25 S:3	0	3	0	0	0	0	1	2	3	0	0
<i>Lilium occidentale</i> western lily	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_BerrySB-Berry Seed Bank	30 350	16 S:7	0	2	0	1	3	1	3	4	4	3	0
<i>Lycopodium clavatum</i> running-pine	G5 S3	None None	Rare Plant Rank - 4.1	180 1,000	120 S:4	0	3	0	0	0	1	1	3	4	0	0
<i>Monotropa uniflora</i> ghost-pipe	G5 S2	None None	Rare Plant Rank - 2B.2	100 100	100 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Montia howellii</i> Howell's montia	G3G4 S2	None None	Rare Plant Rank - 2B.2	50 700	114 S:5	0	0	0	1	3	1	2	3	2	3	0
<i>Myotis evotis</i> long-eared myotis	G5 S3	None None	BLM_S-Sensitive IUCN_LC-Least Concern WBWG_M-Medium Priority	40 40	139 S:1	0	1	0	0	0	0	1	0	1	0	0
<i>Northern Coastal Salt Marsh</i> Northern Coastal Salt Marsh	G3 S3.2	None None			53 S:6	0	0	0	0	0	6	6	0	6	0	0
<i>Nycticorax nycticorax</i> black-crowned night heron	G5 S4	None None	IUCN_LC-Least Concern	4 150	37 S:4	0	0	0	0	0	4	3	1	4	0	0



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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Oenothera wolffii</i> Wolf's evening-primrose	G2 S1	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_BerrySB-Berry Seed Bank	10 10	29 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Oncorhynchus clarkii clarkii</i> coast cutthroat trout	G4T4 S3	None None	AFS_VU-Vulnerable CDFW_SSC-Species of Special Concern USFS_S-Sensitive	20 117	45 S:6	0	0	1	0	0	5	1	5	6	0	0
<i>Oncorhynchus kisutch pop. 2</i> coho salmon - southern Oregon / northern California ESU	G4T2Q S2?	Threatened Threatened	AFS_TH-Threatened	35 117	10 S:3	0	0	1	0	0	2	0	3	3	0	0
<i>Oncorhynchus mykiss irideus pop. 16</i> steelhead - northern California DPS	G5T2T3Q S2S3	Threatened None	AFS_TH-Threatened	35 117	12 S:3	0	1	1	0	0	1	0	3	3	0	0
<i>Pandion haliaetus</i> osprey	G5 S4	None None	CDF_S-Sensitive CDFW_WL-Watch List IUCN_LC-Least Concern	10 880	504 S:20	3	10	3	0	0	4	17	3	20	0	0
<i>Phalacrocorax auritus</i> double-crested cormorant	G5 S4	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	10 10	39 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Rallus obsoletus obsoletus</i> California Ridgway's rail	G5T1 S1	Endangered Endangered	CDFW_FP-Fully Protected NABCI_RWL-Red Watch List		99 S:1	0	0	0	0	1	0	1	0	0	0	1
<i>Rana aurora</i> northern red-legged frog	G4 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	10 600	292 S:18	0	0	0	0	0	18	2	16	18	0	0
<i>Rana boylei</i> foothill yellow-legged frog	G3 S3	None Candidate Threatened	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened USFS_S-Sensitive	36 36	2468 S:1	0	0	0	0	0	1	0	1	1	0	0
<i>Rhyacotriton variegatus</i> southern torrent salamander	G3G4 S2S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	200 800	416 S:4	0	0	1	0	0	3	1	3	4	0	0



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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
<i>Riparia riparia</i> bank swallow	G5 S2	None Threatened	BLM_S-Sensitive IUCN_LC-Least Concern	50 50	298 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Sidalcea malachroides</i> maple-leaved checkerbloom	G3 S3	None None	Rare Plant Rank - 4.2	100 880	136 S:10	1	1	1	5	0	2	4	6	10	0	0
<i>Sidalcea malviflora ssp. patula</i> Siskiyou checkerbloom	G5T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	50 50	53 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Sidalcea oregana ssp. eximia</i> coast checkerbloom	G5T1 S1	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	100 100	19 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Silene scouleri ssp. scouleri</i> Scouler's catchfly	G5T4T5 S2S3	None None	Rare Plant Rank - 2B.2		23 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Spergularia canadensis var. occidentalis</i> western sand-spurrey	G5T4 S1	None None	Rare Plant Rank - 2B.1	5 10	4 S:3	0	0	1	0	0	2	2	1	3	0	0
<i>Spirinchus thaleichthys</i> longfin smelt	G5 S1	Candidate Threatened		0 0	46 S:3	0	0	0	0	0	3	2	1	3	0	0
<i>Thaleichthys pacificus</i> eulachon	G5 S3	Threatened None			10 S:1	0	0	0	0	0	1	1	0	1	0	0
<i>Viola palustris</i> alpine marsh violet	G5 S1S2	None None	Rare Plant Rank - 2B.2	100 100	10 S:2	0	0	0	0	0	2	2	0	2	0	0

APPENDIX C

PLANT SPECIES OBSERVED AT THE PG&E PIPELINE MAINTENANCE SITES

Plant Species Observed in the R-354 Decommissioning Study Area

Family / Common Name	Scientific Name	Growth Habit ¹	Wetland Indicator Status ²	Native Status ³	Sensitivity / Listing Status ⁴
DRYOPTERIDACEAE (Wood Fern Family)					
Western sword fern	<i>Polystichum munitum</i>	F	FACU	N	
EQUISETACEAE (Horsetail Family)					
Common horsetail	<i>Equisetum arvense</i>	H	FAC	N	
CUPRESSACEAE (Cypress Family)					
Monterey cypress	<i>Hesperocyparis macrocarpa</i>	T	NL	N	1B.2
PINACEAE (Pine Family)					
Sitka spruce	<i>Picea sitchensis</i>	T	FAC	N	
Monterey pine	<i>Pinus radiata</i>	T	NL	N	1B.1
APIACEAE (Carrot Family)					
Queen Anne's lace	<i>Daucus carota</i>	H	FACU	I	
Fennel	<i>Foeniculum vulgare</i>	H	NL	I	
Brass buttons	<i>Cotula coronopifolia</i>	H	OBL	I	
ASTERACEAE (Sunflower Family)					
Yarrow	<i>Achillea millefolium</i>	H	FACU	N	
Coyote brush	<i>Baccharis pilularis</i>	S	NL	N	
Canada thistle	<i>Cirsium arvense</i>	H	FAC	I	
Coastal gumplant	<i>Grindelia stricta</i> var. <i>stricta</i>	H	FACW	N	
Bristly ox-tongue	<i>Helminthotheca echioides</i>	H	FAC	I	
Cat's-ear	<i>Hypochaeris glabra</i>	H	NL	I	
Fleshy jaumea	<i>Jaumea carnosa</i>	H	OBL	N	
Hairy hawkbit	<i>Leontodon saxatilis</i> ssp. <i>longirostris</i>	H	FACU	I	
Pineapple weed	<i>Matricaria discoidea</i>	H	FACU	N	
Pacific aster	<i>Symphyotrichum chilense</i>	H	FAC	N	
BRASSICACEAE (Mustard Family)					
Radish	<i>Raphanus sativus</i>	H	NL	I	
CARYOPHYLLACEAE (Pink Family)					
Common mouse-ear chickweed	<i>Cerastium fontanum</i> ssp. <i>vulgare</i>	H	FACU	I	
CHENOPODIACEAE (Goosefoot Family)					
Fat-hen	<i>Atriplex prostrata</i>	H	FAC	I	
Pickleweed	<i>Salicornia pacifica</i>	H	OBL	N	
CONVOLVULACEAE (Morning-Glory Family)					
Bindweed	<i>Convolvulus arvensis</i>	H	NL	I	
DIPSACACEAE (Teasel Family)					
Wild teasel	<i>Dipsacus fullonum</i>	H	FAC	I	
FABACEAE (Legume Family)					
Scotch broom	<i>Cytisus scoparius</i>	H	NL	I	
Bird's-foot trefoil	<i>Lotus corniculatus</i>	H	FAC	I	
Clover	<i>Trifolium</i> sp.	H			
Rose clover	<i>Trifolium hirtum</i>	H	NL	I	
Vetch	<i>Vicia</i> sp.	H			
GERANIACEAE (Geranium Family)					
Cut-leaf geranium	<i>Geranium dissectum</i>	H	NL	I	

Plant Species Observed in the R-354 Decommissioning Study Area

Family / Common Name	Scientific Name	Growth Habit ¹	Wetland Indicator Status ²	Native Status ³	Sensitivity / Listing Status ⁴
LAMIACEAE (Mint Family)					
Pennyroyal	<i>Mentha pulegium</i>	H	OBL	I	
MYRSINACEAE (Myrsine Family)					
Scarlet pimpernel	<i>Lysimachia arvensis</i>	H	FAC	I	
ONAGRACEAE (Evening Primrose Family)					
Hairy willow herb	<i>Epilobium ciliatum</i>	H	FACW	N	
PLANTAGINACEAE (Plantain Family)					
English plantain	<i>Plantago lanceolata</i>	H	FACU	I	
POLYGONACEAE (Buckwheat Family)					
Knotweed	<i>Polygonum aviculare</i>	H	FAC	I	
Curly dock	<i>Rumex crispus</i>	H	FAC	I	
ROSACEAE (Rose Family)					
Silverweed	<i>Potentilla anserina</i>	H	OBL	N	
Himalayan blackberry	<i>Rubus armeniacus</i>	V	FAC	I	
California blackberry	<i>Rubus ursinus</i>	V	FACU	N	
SOLANACEAE (Nightshade Family)					
Common nightshade	<i>Solanum americanum</i>	H	FACU	N	
CYPERACEAE (Cyperus Family)					
Pale spikerush	<i>Eleocharis macrostachya</i>	H	OBL	N	
JUNCACEAE (Rush Family)					
Baltic rush	<i>Juncus balticus</i> ssp. <i>ater</i>	H	FACW	N	
JUNCAGINACEAE (Arrow-grass Family)					
Common arrow-grass	<i>Triglochin maritima</i>	H	OBL	N	
Three-ribbed arrow-grass	<i>Triglochin striata</i>	H	OBL	N	
POACEAE (Grass Family)					
Creeping bent grass	<i>Agrostis stolonifera</i>	G	FAC	I	
Water foxtail	<i>Alopecurus geniculatus</i>	G	OBL	N	
Sweet vernal grass	<i>Anthoxanthum odoratum</i>	G	FACU	I	
Ripgut grass	<i>Bromus diandrus</i>	G	NL	I	
Soft chess	<i>Bromus hordeaceus</i>	G	FACU	I	
Purple pampas grass	<i>Cortaderia jubata</i>	G	FACU	I	
Bristly dogtail grass	<i>Cynosurus echinatus</i>	G	NL	I	
Orchard grass	<i>Dactylis glomerata</i>	G	FACU	I	
Tufted hair grass	<i>Deschampsia cespitosa</i>	G	FACW	N	
Salt grass	<i>Distichlis spicata</i>	G	FACW	N	
Tall fescue	<i>Festuca arundinacea</i>	G	NL	I	
Rye grass	<i>Festuca perennis</i>	G	FAC	I	
Common velvet grass	<i>Holcus lanatus</i>	G	FAC	I	
Meadow barley	<i>Hordeum brachyantherum</i>	G	FACW	N	
Mediterranean barley	<i>Hordeum marinum</i> ssp. <i>gussoneanum</i>	G	FAC	I	
Kentucky blue grass	<i>Poa pratensis</i>	G	FAC	I	
Rabbitfoot grass	<i>Polypogon monspeliensis</i>	G	FACW	I	
Dense-flowered cord grass	<i>Spartina densiflora</i>	G	OBL	I	
² Wetland Indicator Status					

Plant Species Observed in the R-354 Decommissioning Study Area

Family / Common Name	Scientific Name	Growth Habit ¹	Wetland Indicator Status ²	Native Status ³	Sensitivity / Listing Status ⁴
<p>OBL = Obligate wetland species, occurs almost always in wetlands (>99% probability) FACW = Facultative wetland species, usually found in wetlands (67-99% probability) FAC = Facultative species, equally likely to occur in wetland and non-wetlands (34-66% probability) FACU = Facultative upland species, not usually found in wetlands (1-33% probability) UPL = Upland species, almost never found in wetlands (<1% probability) NI = No indicator has been assigned due to a lack of information to determine indicator status NL = Not listed, assumed upland species</p>					
⁴ Sensitivity / Listing Status					
<p>FE = Federal Endangered FT = Federal Threatened FC = Federal Candidate SE = California State Endangered ST = California State Threatened</p>		<p>1B.1 = Threatened in California and elsewhere, seriously threatened in California 1B.2 = Threatened in California and elsewhere, moderately threatened in California 2B = Plants rare, threatened, or endangered in California but more common elsewhere 3 = Plants about which more information is needed 4 = Plants of limited distribution</p>			
¹ Growth Habit		³ Native Status			
<p>G = Grass H = Herb S = Shrub T = Tree</p>		<p>N = Native I = Introduced</p>			

Table B-1. Comprehensive list of vascular plant species observed within the Project area during the May and July 2019 botanical surveys.

Scientific name	Common name	Family	Native status	Cal-IPC Rating	WMVC wetland plant rating
<i>Achillea millefolium</i>	common yarrow	Asteraceae	Native	None	FACU
<i>Agrostis stolonifera</i>	creeping bent	Poaceae	Naturalized	Limited	FAC
<i>Aira caryophyllaea</i>	silver hair grass	Poaceae	Naturalized	None	FACU
<i>Allium triquetrum</i>	threecorner leek	Alliaceae	Naturalized	None	NL/UPL
<i>Alopecurus geniculatus</i>	water foxtail	Poaceae	Native	None	OBL
<i>Amaryllis belladonna</i>	naked ladies	Amaryllidaceae	Naturalized	None	NL/UPL
<i>Angelica lucida</i>	sea-watch	Apiaceae	Native	None	FAC
<i>Anthemis cotula</i>	mayweed	Asteraceae	Naturalized	None	FACU
<i>Anthoxanthum odoratum</i>	sweet vernal grass	Poaceae	Naturalized	Limited	FACU
<i>Atriplex prostrata</i>	fat-hen	Chenopodiaceae	Naturalized	None	FAC
<i>Avena barbata</i>	slender wild oat	Poaceae	Naturalized	Moderate	NL/UPL
<i>Avena sativa</i>	cultivated oat	Poaceae	Naturalized	None	UPL
<i>Baccharis glutinosa</i>	marsh baccharis	Asteraceae	Native	None	OBL
<i>Baccharis pilularis</i>	coyote brush	Asteraceae	Native	None	NL/UPL
<i>Bellis perennis</i>	English daisy	Asteraceae	Naturalized	None	NL/UPL
<i>Bolboschoenus maritimus</i> subsp. <i>paludosus</i>	saltmarsh bulrush	Cyperaceae	Native	None	OBL
<i>Brassica rapa</i>	turnip	Brassicaceae	Naturalized	Limited	FACU
<i>Briza minor</i>	annual quaking grass	Poaceae	Naturalized	None	FAC
<i>Bromus carinatus</i>	California brome	Poaceae	Native	None	NL/UPL
<i>Bromus diandrus</i>	ripgut grass	Poaceae	Naturalized	Moderate	NL/UPL
<i>Bromus hordeaceus</i>	soft chess	Poaceae	Naturalized	Limited	FACU
<i>Carex lyngbyei</i>	Lyngbye's sedge	Cyperaceae	Native	None	OBL
<i>Castilleja ambigua</i> subsp. <i>humboldtensis</i>	Humboldt Bay owl's-clover	Orobanchaceae	Native	None	FACW
<i>Cerastium glomeratum</i>	sticky mouse-ear chickweed	Caryophyllaceae	Naturalized	None	FACU
<i>Chenopodium album</i>	lamb's quarters	Chenopodiaceae	Naturalized	None	FACU
<i>Cirsium arvense</i>	Canada thistle	Asteraceae	Naturalized	Moderate	FAC
<i>Cirsium vulgare</i>	bull thistle	Asteraceae	Naturalized	Moderate	FACU
<i>Conium maculatum</i>	poison hemlock	Apiaceae	Naturalized	Moderate	FAC
<i>Convolvulus arvensis</i>	bindweed	Convolvulaceae	Naturalized	None	NL/UPL
<i>Cortaderia jubata</i>	purple pampas grass	Poaceae	Naturalized	High	FACU
<i>Cotoneaster franchetii</i>	Franchet's cotoneaster	Rosaceae	Naturalized	Moderate	NL/UPL
<i>Cotula coronopifolia</i>	brass-buttons	Asteraceae	Naturalized	Limited	OBL

Scientific name	Common name	Family	Native status	Cal-IPC Rating	WMVC wetland plant rating
<i>Cuscuta salina</i>	salt dodder	Convolvulaceae	Native	None	NL/UPL
<i>Cynosurus echinatus</i>	bristly dogtail grass	Poaceae	Naturalized	Moderate	NL/UPL
<i>Cytisus scoparius</i>	Scotch broom	Fabaceae	Naturalized	High	NL/UPL
<i>Dactylis glomerata</i>	orchardgrass	Poaceae	Naturalized	Limited	FACU
<i>Daucus carota</i>	Queen Anne's lace	Apiaceae	Naturalized	None	FACU
<i>Deschampsia cespitosa</i>	tufted hair grass	Poaceae	Native	None	NL/UPL
<i>Dipsacus fullonum</i>	wild teasel	Dipsacaceae	Naturalized	Moderate	FAC
<i>Distichlis spicata</i>	salt grass	Poaceae	Native	None	FACW
<i>Eleocharis macrostachya</i>	pale spikerush	Cyperaceae	Native	None	OBL
<i>Epilobium ciliatum</i>	fringed willowherb	Onagraceae	Native	None	FACW
<i>Equisetum arvense</i>	common horsetail	Equisetaceae	Native	None	FAC
<i>Erigeron canadensis</i>	horseweed	Asteraceae	Native	None	FACU
<i>Erodium moschatum</i>	greenstem filaree	Geraniaceae	Naturalized	None	NL/UPL
<i>Euphorbia helioscopia</i>	wartweed	Euphorbiaceae	Naturalized	None	NL/UPL
<i>Festuca arundinacea</i>	tall fescue	Poaceae	Naturalized	Moderate	FAC
<i>Festuca bromoides</i>	brome fescue	Poaceae	Naturalized	None	FAC
<i>Festuca perennis</i>	rye grass	Poaceae	Naturalized	Moderate	FAC
<i>Festuca rubra</i>	red fescue	Poaceae	Native	None	FAC
<i>Foeniculum vulgare</i>	fennel	Apiaceae	Naturalized	Moderate	NL/UPL
<i>Frangula purshiana</i>	cascara	Rhamnaceae	Native	None	FAC
<i>Galium aparine</i>	goose grass	Rubiaceae	Native	None	FACU
<i>Geranium dissectum</i>	cutleaf geranium	Geraniaceae	Naturalized	Limited	NL/UPL
<i>Grindelia stricta</i> var. <i>stricta</i>	Oregon gumweed	Asteraceae	Native	None	FACW
<i>Helminthotheca echioides</i>	bristly ox-tongue	Asteraceae	Naturalized	Limited	FAC
<i>Hesperocyparis macrocarpa</i>	Monterey cypress	Cupressaceae	Native	None	NL/UPL
<i>Holcus lanatus</i>	common velvet grass	Poaceae	Naturalized	Moderate	FAC
<i>Hordeum brachyantherum</i>	meadow barley	Poaceae	Native	None	FACW
<i>Hordeum marinum</i> subsp. <i>gussoneanum</i>	mediterranean barley	Poaceae	Naturalized	Moderate	NL/UPL
<i>Hordeum murinum</i>	wall barley	Poaceae	Naturalized	Moderate	FAC
<i>Hypochaeris radicata</i>	rough cat's-ear	Asteraceae	Naturalized	Moderate	FACU
<i>Ilex aquifolium</i>	English holly	Aquifoliaceae	Naturalized	Limited	FACU
<i>Iris douglasiana</i>	Douglas iris	Iridaceae	Native	None	NL/UPL

Scientific name	Common name	Family	Native status	Cal-IPC Rating	WMVC wetland plant rating
<i>Isolepis cernua</i>	low bulrush	Cyperaceae	Native	None	OBL
<i>Jaumea carnosa</i>	marsh jaumea	Asteraceae	Native	None	OBL
<i>Juncus bufonius</i>	toad rush	Juncaceae	Native	None	FACW
<i>Juncus effusus</i>	soft rush	Juncaceae	Native	None	FACW
<i>Juncus lescurii</i>	San Francisco rush	Juncaceae	Native	None	FACW
<i>Leontodon saxatilis</i>	hairy hawkbit	Asteraceae	Naturalized	None	FACU
<i>Limonium californicum</i>	western marsh-rosemary	Plumbaginaceae	Native	None	OBL
<i>Lonicera involucrata</i>	twinberry	Caprifoliaceae	Native	None	FAC
<i>Lotus corniculatus</i>	bird's-foot trefoil	Fabaceae	Naturalized	None	FAC
<i>Lupinus rivularis</i>	riverbank lupine	Fabaceae	Native	None	FAC
<i>Lysimachia arvensis</i>	scarlet pimpernel	Myrsinaceae	Naturalized	None	NL/UPL
<i>Madia sativa</i>	coast tarweed	Asteraceae	Native	None	NL/UPL
<i>Malva neglecta</i>	common mallow	Malvaceae	Naturalized	None	NL/UPL
<i>Marah oregana</i>	coast man-root	Cucurbitaceae	Native	None	NL/UPL
<i>Matricaria discoidea</i>	pineapple weed	Asteraceae	Native	None	FACU
<i>Medicago arabica</i>	burclover	Fabaceae	Naturalized	None	NL/UPL
<i>Medicago polymorpha</i>	California burclover	Fabaceae	Naturalized	Limited	FACU
<i>Mentha pulegium</i>	pennyroyal	Lamiaceae	Naturalized	Moderate	OBL
<i>Morella californica</i>	wax myrtle	Myricaceae	Native	None	FACW
<i>Navarretia squarrosa</i>	skunkweed	Polemoniaceae	Native	None	FACU
<i>Parapholis strigosa</i>	strigose sicklegrass	Poaceae	Naturalized	None	OBL
<i>Parentucellia viscosa</i>	yellow glandweed	Orobanchaceae	Naturalized	Limited	FAC
<i>Picea sitchensis</i>	Sitka spruce	Pinaceae	Native	None	FAC
<i>Pinus muricata</i>	Bishop pine	Pinaceae	Native	None	NL/UPL
<i>Plantago lanceolata</i>	English plantain	Plantaginaceae	Naturalized	Limited	FACU
<i>Plantago major</i>	common plantain	Plantaginaceae	Naturalized	None	FAC
<i>Poa annua</i>	annual blue grass	Poaceae	Naturalized	None	FAC
<i>Poa pratensis</i> subsp. <i>pratensis</i>	Kentucky blue grass	Poaceae	Naturalized	Limited	FAC
<i>Polygonum aviculare</i>	knotweed	Polygonaceae	Naturalized	None	FAC
<i>Polypogon monspeliensis</i>	annual beard grass	Poaceae	Naturalized	Limited	FACW
<i>Polystichum munitum</i>	western sword fern	Dryopteridaceae	Native	None	FACU
<i>Potentilla anserina</i> subsp. <i>pacifica</i>	Pacific silverweed	Rosaceae	Native	None	OBL
<i>Pteridium aquilinum</i> var. <i>pubescens</i>	hairy brackenfern	Dennstaedtiaceae	Native	None	FACU
<i>Ranunculus repens</i>	creeping buttercup	Ranunculaceae	Naturalized	Limited	FAC

Scientific name	Common name	Family	Native status	Cal-IPC Rating	WMVC wetland plant rating
<i>Ranunculus sardous</i>	hairy buttercup	Ranunculaceae	Naturalized	None	FAC
<i>Raphanus sativus</i>	radish	Brassicaceae	Naturalized	Limited	NL/UPL
<i>Rhododendron macrophyllum</i>	California rhododendron	Ericaceae	Native	None	FACU
<i>Rubus armeniacus</i>	Himalayan blackberry	Rosaceae	Naturalized	High	FAC
<i>Rubus leucodermis</i>	whitebark raspberry	Rosaceae	Native	None	FACU
<i>Rubus ursinus</i>	California blackberry	Rosaceae	Native	None	FACU
<i>Rumex acetosella</i>	sheep sorrel	Polygonaceae	Naturalized	Moderate	FACU
<i>Rumex crispus</i>	curly dock	Polygonaceae	Naturalized	Limited	FAC
<i>Rumex occidentalis</i>	western dock	Polygonaceae	Native	None	FACW
<i>Rumex pulcher</i>	fiddle dock	Polygonaceae	Naturalized	None	FAC
<i>Rumex transitorius</i>	Pacific willow dock	Polygonaceae	Native	None	FACW
<i>Salicornia pacifica</i>	Pacific pickleweed	Chenopodiaceae	Native	None	OBL
<i>Sambucus racemosa</i> var. <i>racemosa</i>	red elderberry	Adoxaceae	Native	None	NL/UPL
<i>Scirpus microcarpus</i>	panicled bulrush	Cyperaceae	Native	None	OBL
<i>Senecio glomeratus</i>	cutleaf burnweed	Asteraceae	Naturalized	Moderate	NL/UPL
<i>Silybum marianum</i>	blessed milk thistle	Asteraceae	Naturalized	Limited	NL/UPL
<i>Sisymbrium officinale</i>	hedge mustard	Brassicaceae	Naturalized	None	NL/UPL
<i>Sonchus asper</i> subsp. <i>asper</i>	prickly sow thistle	Asteraceae	Naturalized	None	NL/UPL
<i>Sonchus oleraceus</i>	common sow thistle	Asteraceae	Naturalized	None	UPL
<i>Spartina densiflora</i>	dense-flowered cord grass	Poaceae	Naturalized	High	OBL
<i>Spergularia canadensis</i> var. <i>occidentalis</i>	western sand-spurrey	Caryophyllaceae	Native	None	FACW
<i>Spergularia rubra</i>	red sand-spurrey	Caryophyllaceae	Naturalized	None	FAC
<i>Symphyotrichum chilense</i>	Pacific aster	Asteraceae	Native	None	FAC
<i>Symphyotrichum subspicatum</i>	Douglas aster	Asteraceae	Native	None	FACW
<i>Taraxacum officinale</i>	common dandelion	Asteraceae	Naturalized	None	FACU
<i>Trifolium dubium</i>	little hop clover	Fabaceae	Naturalized	None	FACU
<i>Trifolium pratense</i>	red clover	Fabaceae	Naturalized	None	FACU
<i>Trifolium repens</i>	white clover	Fabaceae	Naturalized	None	FAC

Scientific name	Common name	Family	Native status	Cal-IPC Rating	WMVC wetland plant rating
<i>Trifolium subterraneum</i>	subterranean clover	Fabaceae	Naturalized	None	NL/UPL
<i>Trifolium wormskioldii</i>	cow clover	Fabaceae	Native	None	FACW
<i>Triglochin maritima</i>	common arrow-grass	Juncaginaceae	Native	None	OBL
<i>Veronica persica</i>	Persian speedwell	Plantaginaceae	Naturalized	None	NL/UPL
<i>Vicia gigantea</i>	giant vetch	Fabaceae	Native	None	FACU
<i>Vicia hirsuta</i>	tiny vetch	Fabaceae	Naturalized	None	NL/UPL
<i>Vicia sativa</i>	garden vetch	Fabaceae	Naturalized	None	UPL
<i>Zostera marina</i>	eelgrass	Zosteraceae	Native	None	OBL

Table B-1. Comprehensive list of vascular plant species observed within the Survey Area during the 24 May 2017 and 28 July 2017 botanical surveys.

Scientific name	Common name	Family	Native?	Cal-IPC rating
<i>Acer macrophyllum</i>	big-leaf maple	Sapindaceae	Yes	-
<i>Achillea millefolium</i>	common yarrow	Asteraceae	Yes	-
<i>Agrostis stolonifera</i>	creeping bent	Poaceae	No	Limited
<i>Alnus rubra</i>	red alder	Betulaceae	Yes	-
<i>Alopecurus geniculatus</i>	water foxtail	Poaceae	Yes	-
<i>Amaryllis belladonna</i>	naked ladies	Amaryllidaceae	No	-
<i>Anagallis arvensis</i>	scarlet pimpernel	Myrsinaceae	No	-
<i>Angelica lucida</i>	sea-watch	Apiaceae	Yes	-
<i>Anthoxanthum odoratum</i>	sweet vernal grass	Poaceae	No	Moderate
<i>Arctotheca prostrata</i>	prostrate capeweed	Asteraceae	No	-
<i>Athyrium filix-femina</i> var. <i>cyclosorum</i>	common lady-fern	Woodsiaceae	Yes	-
<i>Atriplex prostrata</i>	fat-hen	Chenopodiaceae	Yes	-
<i>Avena barbata</i>	slender wild oat	Poaceae	No	Moderate
<i>Baccharis pilularis</i>	coyote brush	Asteraceae	Yes	-
<i>Bellis perennis</i>	English daisy	Asteraceae	No	-
<i>Bolboschoenus maritimus</i> ssp. <i>paludosus</i>	saltmarsh bulrush, alkali bulrush	Cyperaceae	Yes	-
<i>Briza maxima</i>	rattlesnake grass, large quaking grass	Poaceae	No	Limited
<i>Bromus carinatus</i>	California brome	Poaceae	Yes	-
<i>Bromus diandrus</i>	ripgut grass	Poaceae	No	Moderate
<i>Bromus hordeaceus</i>	soft chess	Poaceae	No	Limited
<i>Buddleja davidii</i>	butterfly bush, summer lilac	Scrophulariaceae	No	-
<i>Cardamine oligosperma</i>	little western bittercress	Brassicaceae	Yes	-
<i>Cardionema ramosissimum</i>	sandcarpet	Caryophyllaceae	Yes	-
<i>Carex lyngbyei</i>	Lyngbye's sedge	Cyperaceae	Yes	-
<i>Castilleja ambigua</i> subsp. <i>humboldtiensis</i>	Humboldt Bay owl's-clover	Orobanchaceae	Yes	-
<i>Cerastium fontanum</i> subsp. <i>vulgare</i>	common mouse-ear chickweed	Caryophyllaceae	No	-
<i>Cerastium glomeratum</i>	sticky mouse-ear chickweed	Caryophyllaceae	No	-
<i>Cirsium arvense</i>	Canada thistle	Asteraceae	No	Moderate
<i>Cirsium vulgare</i>	bull thistle	Asteraceae	No	Moderate
<i>Conium maculatum</i>	poison hemlock	Apiaceae	No	Moderate
<i>Convolvulus arvensis</i>	bindweed, orchard morning-glory	Convolvulaceae	No	-
<i>Cortaderia jubata</i>	purple pampas grass	Poaceae	No	High
<i>Cotula coronopifolia</i>	brass buttons	Asteraceae	No	Limited
<i>Crocasmia ×crocosmiiflora</i>	garden montbretia	Iridaceae	No	-

Scientific name	Common name	Family	Native?	Cal-IPC rating
<i>Cynosurus echinatus</i>	bristly dogtail grass	Poaceae	No	Moderate
<i>Cytisus scoparius</i>	scotch broom	Fabaceae	No	High
<i>Dactylis glomerata</i>	orchardgrass	Poaceae	No	Limited
<i>Daucus carota</i>	carrot, Queen Anne's lace	Apiaceae	No	-
<i>Deschampsia cespitosa</i>	tufted hair grass	Poaceae	Yes	-
<i>Dipsacus fullonum</i>	wild teasel	Dipsacaceae	No	Moderate
<i>Distichlis spicata</i>	salt grass	Poaceae	Yes	-
<i>Eleocharis macrostachya</i>	spikerush	Cyperaceae	Yes	-
<i>Eleocharis palustris</i>	common spikerush	Cyperaceae	Yes	-
<i>Epilobium ciliatum</i>	fringed willowherb	Onagraceae	Yes	-
<i>Equisetum arvense</i>	common horsetail	Equisetaceae	Yes	-
<i>Eschscholzia californica</i>	California poppy	Papaveraceae	Yes	-
<i>Festuca arundinacea</i>	tall fescue	Poaceae	No	Moderate
<i>Festuca bromoides</i>	brome fescue	Poaceae	No	-
<i>Festuca myuros</i>	rattail sixweeks grass	Poaceae	No	Moderate
<i>Festuca perennis</i>	rye grass	Poaceae	No	Moderate
<i>Festuca rubra</i>	red fescue	Poaceae	Yes	-
<i>Foeniculum vulgare</i>	fennel	Apiaceae	No	High
<i>Frangula purshiana</i>	cascara	Rhamnaceae	Yes	-
<i>Galium aparine</i>	goose grass	Rubiaceae	Yes	-
<i>Geranium dissectum</i>	cutleaf geranium	Geraniaceae	No	Limited
<i>Geranium molle</i>	dove-footed geranium	Geraniaceae	No	-
<i>Glyceria declinata</i>	low manna grass	Poaceae	No	Moderate
<i>Grindelia stricta</i> var. <i>stricta</i>	Oregon gumplant	Asteraceae	Yes	-
<i>Hedera helix</i>	English ivy	Araliaceae	No	High
<i>Helminthotheca echioides</i>	bristly ox-tongue	Asteraceae	No	Limited
<i>Hesperocyparis macrocarpa</i>	Monterey cypress	Cupressaceae	Yes	-
<i>Hieracium albiflorum</i>	white hawkweed	Asteraceae	Yes	-
<i>Hirschfeldia incana</i>	shortpod mustard	Brassicaceae	No	Moderate
<i>Holcus lanatus</i>	common velvet grass	Poaceae	No	Moderate
<i>Hordeum brachyantherum</i>	meadow barley	Poaceae	Yes	-
<i>Hordeum marinum</i> subsp. <i>gussoneanum</i>	Mediterranean barley	Poaceae	No	Moderate
<i>Hordeum murinum</i>	wall barley	Poaceae	No	Moderate
<i>Hydrocotyle ranunculoides</i>	floating marshpennywort	Araliaceae	Yes	-
<i>Ilex aquifolium</i>	English holly	Aquifoliaceae	No	Moderate
<i>Iris douglasiana</i>	Douglas iris	Iridaceae	Yes	-
<i>Jaumea carnosa</i>	marsh jaumea	Asteraceae	Yes	-
<i>Juncus breweri</i>	salt rush	Juncaceae	Yes	-

Scientific name	Common name	Family	Native?	Cal-IPC rating
<i>Juncus bufonius</i>	toad rush	Juncaceae	Yes	-
<i>Juncus effusus</i>	soft or lamp rush	Juncaceae	Yes	-
<i>Juncus lescurii</i>	San Francisco rush	Juncaceae	Yes	-
<i>Juncus patens</i>	spreading rush	Juncaceae	Yes	-
<i>Lamium purpureum</i>	purple deadnettle	Lamiaceae	No	-
<i>Lathyrus latifolius</i>	perennial sweet pea	Fabaceae	No	-
<i>Lemna minor</i>	lesser duckweed	Araceae	Yes	-
<i>Leontodon saxatilis</i>	hairy hawkbit	Asteraceae	No	-
<i>Leucanthemum vulgare</i>	ox-eye daisy	Asteraceae	No	Moderate
<i>Linum bienne</i>	pale flax	Linaceae	No	-
<i>Lonicera hispidula</i>	pink honeysuckle	Caprifoliaceae	Yes	-
<i>Lonicera involucrata</i>	twinberry	Caprifoliaceae	Yes	-
<i>Lotus corniculatus</i>	bird's-foot trefoil	Fabaceae	No	-
<i>Lupinus rivularis</i>	riverbank lupine	Fabaceae	Yes	-
<i>Lythrum hyssopifolia</i>	hyssop loosestrife	Lythraceae	No	Limited
<i>Malus fusca</i>	Oregon crab apple	Rosaceae	Yes	-
<i>Marah oregana</i>	coast man-root	Cucurbitaceae	Yes	-
<i>Matricaria discoidea</i>	pineapple weed, rayless chamomile	Asteraceae	No	-
<i>Medicago polymorpha</i>	California burclover	Fabaceae	No	Limited
<i>Mentha pulegium</i>	pennyroyal	Lamiaceae	No	Moderate
<i>Myosotis discolor</i>	changing forget-me-not	Boraginaceae	No	-
<i>Nasturtium officinale</i>	water cress	Brassicaceae	No	-
<i>Oenanthe sarmentosa</i>	water parsley	Apiaceae	Yes	-
<i>Oxalis pes-caprae</i>	bermuda buttercup	Oxalidaceae	No	Moderate
<i>Parentucellia viscosa</i>	yellow glandweed	Orobanchaceae	No	Limited
<i>Phleum pratense</i>	cultivated timothy	Poaceae	No	-
<i>Picea sitchensis</i>	Sitka spruce	Pinaceae	Yes	-
<i>Plantago lanceolata</i>	English plantain	Plantaginaceae	No	Limited
<i>Plantago major</i>	common plantain	Plantaginaceae	No	-
<i>Poa annua</i>	annual bluegrass	Poaceae	No	-
<i>Poa pratensis</i>	Kentucky bluegrass	Poaceae	No	Limited
<i>Polygonum aviculare</i>	knotweed, knotgrass	Polygonaceae	No	-
<i>Polypodium scolieri</i>	leather-leaf fern	Polypodiaceae	Yes	-
<i>Polypogon monspeliensis</i>	annual beard grass, rabbitfoot grass	Poaceae	No	Limited
<i>Polystichum munitum</i>	western swordfern	Dryopteridaceae	Yes	-
<i>Potentilla anserina</i>	pacific silverweed	Rosaceae	Yes	-
<i>Poterium sanguisorba</i>	garden burnet	Rosaceae	No	-
<i>Prunella vulgaris</i>	common selfheal	Lamiaceae	Yes	-
<i>Prunus cerasifera</i>	cherry plum	Rosaceae	No	Limited

Scientific name	Common name	Family	Native?	Cal-IPC rating
<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	Douglas-fir	Pinaceae	Yes	-
<i>Pteridium aquilinum</i> var. <i>pubescens</i>	western brackenfern	Dennstaedtiaceae	Yes	-
<i>Ranunculus occidentalis</i> var. <i>occidentalis</i>	western buttercup	Ranunculaceae	Yes	-
<i>Ranunculus repens</i>	creeping buttercup	Ranunculaceae	No	Limited
<i>Ranunculus sardous</i>	hairy buttercup	Ranunculaceae	No	-
<i>Raphanus sativus</i>	radish	Brassicaceae	No	Limited
<i>Ribes</i> sp.	currant	Grossulariaceae	Yes	-
<i>Rosa nutkana</i> subsp. <i>nutkana</i>	Nootka rose	Rosaceae	Yes	-
<i>Rubus armeniacus</i>	Himalayan blackberry	Rosaceae	No	High
<i>Rubus ursinus</i>	California blackberry	Rosaceae	Yes	-
<i>Rumex acetosella</i>	sheep sorrel	Polygonaceae	No	Moderate
<i>Rumex crispus</i>	curly dock	Polygonaceae	No	Limited
<i>Rumex occidentalis</i>	western dock	Polygonaceae	Yes	-
<i>Salix hookeriana</i>	coastal willow	Salicaceae	Yes	-
<i>Salix lasiolepis</i>	arroyo willow	Salicaceae	Yes	-
<i>Salix scouleriana</i>	Scouler's willow	Salicaceae	Yes	-
<i>Sambucus racemosa</i>	red elderberry	Adoxaceae	Yes	-
<i>Scirpus microcarpus</i>	panicked bulrush	Cyperaceae	Yes	-
<i>Sequoia sempervirens</i>	redwood	Cupressaceae	Yes	-
<i>Sonchus asper</i> subsp. <i>asper</i>	prickly sow thistle	Asteraceae	No	-
<i>Sonchus oleraceus</i>	common sow thistle	Asteraceae	No	-
<i>Spartina densiflora</i>	dense-flowered cordgrass	Poaceae	No	High
<i>Spergularia macrotheca</i> var. <i>macrotheca</i>	sticky sandspurry	Caryophyllaceae	Yes	-
<i>Stachys mexicana</i>	Mexican hedgenettle	Lamiaceae	Yes	-
<i>Symphoricarpos albus</i> var. <i>laevigatus</i>	snowberry	Caprifoliaceae	Yes	-
<i>Symphyotrichum chilense</i>	pacific aster	Asteraceae	Yes	-
<i>Trientalis latifolia</i>	broadleaf starflower	Myrsinaceae	Yes	-
<i>Trifolium dubium</i>	little hop clover	Fabaceae	No	-
<i>Trifolium hirtum</i>	rose clover	Fabaceae	No	Limited
<i>Trifolium repens</i>	white clover	Fabaceae	No	-
<i>Trifolium wormskioldii</i>	cow clover	Fabaceae	Yes	-
<i>Triglochin maritima</i>	common arrow-grass	Juncaginaceae	Yes	-
<i>Triglochin striata</i>	three-ribbed arrow-grass	Juncaginaceae	Yes	-
<i>Typha latifolia</i>	broad-leaved cattail	Typhaceae	Yes	-
<i>Vaccinium ovatum</i>	California huckleberry	Ericaceae	Yes	-
<i>Vaccinium parvifolium</i>	red huckleberry	Ericaceae	Yes	-

Scientific name	Common name	Family	Native?	Cal-IPC rating
<i>Veronica americana</i>	American brooklime	Plantaginaceae	Yes	-
<i>Vicia hirsuta</i>	tiny vetch	Fabaceae	No	-
<i>Vicia sativa</i> subsp. <i>nigra</i>	narrow-leaved vetch	Fabaceae	No	-
<i>Vicia sativa</i> subsp. <i>sativa</i>	spring vetch	Fabaceae	No	-
<i>Vicia tetrasperma</i>	sparrow vetch	Fabaceae	No	-
<i>Zantedeschia aethiopica</i>	calla lily	Araceae	No	Limited

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BLECHNACEAE (Deer Fern Family)						
Deer fern	<i>Struthiopteris spicant</i>	F	FAC	N	3	
DENNSTAEDTIACEAE (Bracken Family)						
Bracken fern	<i>Pteridium aquilinum</i> var. <i>pubescens</i>	F	FACU	N	1, 3	
DRYOPTERIDACEAE (Wood Fern Family)						
Wood fern	<i>Dryopteris arguta</i>	F	NL	N	2, 3	
Narrowleaf sword fern	<i>Polystichum imbricans</i>	F	NL	N	2	
Western sword fern	<i>Polystichum munitum</i>	F	FACU	N	1, 2, 3	
EQUISETACEAE (Horsetail Family)						
Common horsetail	<i>Equisetum arvense</i>	H	FAC	N	1, 2, 3	
POLYPODIACEAE (Polypody Family)						
Leather-leaf fern	<i>Polypodium scolieri</i>	F	NL	N	3	
WOODSIACEAE (Cliff Fern Family)						
Lady fern	<i>Athyrium filix-femina</i> var. <i>cyclosorum</i>	F	FAC	N	1, 2, 3	
CUPRESSACEAE (Cypress Family)						
Redwood	<i>Sequoia sempervirens</i>	T	NL	N	1, 2, 3	
PINACEAE (Pine Family)						
Grand fir	<i>Abies grandis</i>	T	FACU	N	1, 2	
Sitka spruce	<i>Picea sitchensis</i>	T	FAC	N	1, 2, 3	
Douglas fir	<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	T	FACU	N	1, 2, 3	
ARISTOLOCHACEAE (Pipevine Family)						
Creeping wild ginger	<i>Asarum caudatum</i>	H	FACU	N	1, 2, 3	
ADOXACEAE (Muskroot Family)						
Red elderberry	<i>Sambucus racemosa</i>	S	FACU	N	1, 2, 3	
ANACARDIACEAE (Sumac or Cashew Family)						
Poison oak	<i>Toxicodendron diversilobum</i>	S	FAC	N	2	
APIACEAE (Carrot Family)						
Poison hemlock	<i>Conium maculatum</i>	H	FAC	I	2, 3	
Queen Anne's lace	<i>Daucus carota</i>	H	FACU	I	2, 3	
Cow parsnip	<i>Heracleum maximum</i>	H	FAC	N	2, 3	
Water parsley	<i>Oenanthe sarmentosa</i>	H	OBL	N	1, 2, 3	
Pacific sanicle	<i>Sanicula crassicaulis</i>	H	NL	N	2, 3	
APOCYNACEAE (Dogbane Family)						
Greater periwinkle	<i>Vinca major</i>	H		I	3	
AQUIFOLIACEAE (Holly Family)						
English holly	<i>Ilex aquifolium</i>	T	FACU	I	2, 3	
ARALIACEAE (Ginseng Family)						
English ivy	<i>Hedera helix</i>	V	FACU	I	1, 2, 3	
ASTERACEAE (Sunflower Family)						
Yarrow	<i>Achillea millefolium</i>	H	FACU	N	3	

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Pearly everlasting	<i>Anaphalis margaritacea</i>	H	FACU	N	3	
Coyote brush	<i>Baccharis pilularis</i>	S	NL	N	2	
English daisy	<i>Bellis perennis</i>	H	NL	N	3	
Canada thistle	<i>Cirsium arvense</i>	H	FAC	I	3	
Bull thistle	<i>Cirsium vulgare</i>	H	FACU	I	1, 2	
Smooth hawkbeard	<i>Crepis capillaris</i>	H	FACU	I	2	
Bristly ox-tongue	<i>Helminthotheca echioides</i>	H	FAC	I	1, 2, 3	
Rough cat's-ear	<i>Hypochaeris radicata</i>	H	FACU	I	2, 3	
Hairy hawkbit	<i>Leontodon saxatilis</i> ssp. <i>longirostris</i>	H	FACU	I	2	
Ox-eye daisy	<i>Leucanthemum vulgare</i>	H	FACU	I	2	
Common madia	<i>Madia elegans</i>	H	NL	N	3	
Pineapple weed	<i>Matricaria discoidea</i>	H	FACU	N	2	
Western sweet coltsfoot	<i>Petasites frigidus</i> var. <i>palmatus</i>	H	FACW	N	2	
Milk thistle	<i>Silybum marianum</i>	H	NL	I	2	
Perennial sow thistle	<i>Sonchus arvensis</i>	H	FACU	I	3	
Prickly sow thistle	<i>Sonchus asper</i> ssp. <i>asper</i>	H	FACU	I	1, 2, 3	
Common sow thistle	<i>Sonchus oleraceus</i>	H	UPL	I	2	
Pacific aster	<i>Symphyotrichum chilense</i>	H	FAC	N	1, 2	
Common dandelion	<i>Taraxacum officinale</i>	H	FACU	I	2	
BETULACEAE (Birch Family)						
Red Alder	<i>Alnus rubra</i>	T	FACW	N	1, 2, 3	
BORAGINACEAE (Borage Family)						
Changing forget-me-not	<i>Myosotis discolor</i>	H	FAC	I	2	
BRASSICACEAE (Mustard Family)						
Field mustard	<i>Brassica rapa</i>	H	FACU	I	3	
Milk maids	<i>Cardamine californica</i>	H	FAC	N	3	
Few-seed bittercress	<i>Cardamine oligosperma</i>	H	FAC	N	2	
Radish	<i>Raphanus sativus</i>	H	NL	I	3	
CAPRIFOLIACEAE (Honeysuckle Family)						
Honeysuckle	<i>Lonicera hispidula</i>	S	FACU	N	3	
Twinberry	<i>Lonicera involucrata</i>	S	FAC	N	2, 3	
Snowberry	<i>Symphoricarpos albus</i> var. <i>laevigatus</i>	S	FACU	N	2	
Creeping snowberry	<i>Symphoricarpos mollis</i>	S	FACU	N	2	
Common chickweed	<i>Stellaria media</i>	H	FACU	I	2	
CELASTRACEAE (Staff-Tree Family)						
Western burning nush	<i>Euonymus occidentalis</i>	S	FAC	N	2	
CONVOLVULACEAE (Morning-Glory Family)						

Plant Species Observed in the RT-102 Remediation Study Area

Common Name/Family	Scientific Name	Growth Habit ¹	Wetland Indicator Status ²	Native Status ³	Source ⁴	Sensitivity / Listing Status ⁵
Bindweed	<i>Convolvulus arvensis</i>	H	NL	I	3	
CUCURBITACEAE (Gourd Family)						
Coast man-root	<i>Marah oregana</i>	H	NL	N	2, 3	
ERICACEAE (Heath Family)						
California huckleberry	<i>Vaccinium ovatum</i>	S	FACU	N	2, 3	
Red huckleberry	<i>Vaccinium parvifolium</i>	S	FACU	N	2, 3	
FABACEAE (Legume Family)						
Scotch broom	<i>Cytisus scoparius</i>	H	NL	I	1, 2	
Bird's-foot trefoil	<i>Lotus corniculatus</i>	H	FAC	I	1, 2, 3	
White sweetclover	<i>Melilotus albus</i>	H	NL	I	3	
Little hop clover	<i>Trifolium dubium</i>	H	FACU	I	2, 3	
White clover	<i>Trifolium repens</i>	H	FAC	I	1, 2, 3	
Cow clover	<i>Trifolium wormsoldii</i>	H	FACW	N	3	
American vetch	<i>Vicia americana</i> ssp. <i>americana</i>	H	FAC	N	3	
Purple vetch	<i>Vicia benghalensis</i>	H	NL	I	3	
Hairy vetch	<i>Vicia hirsuta</i>	H	NL	I	3	
Narrow-leaf vetch	<i>Vicia sativa</i> ssp. <i>nigra</i>	H	UPL	I	2	
Spring vetch	<i>Vicia sativa</i> ssp. <i>sativa</i>	H	UPL	I	2, 3	
GERANIACEAE (Geranium Family)						
Redstem filaree	<i>Erodium cicutarium</i>	H	NL	I	3	
Cut-leaf geranium	<i>Geranium dissectum</i>	H	NL	I	1, 2, 3	
Dove's-foot geranium	<i>Geranium molle</i>	H	NL	I	3	
GROSSULARIACEAE (Gooseberry Family)						
Red-flowering currant	<i>Ribes sanguineum</i>	S	FACU	N	2, 3	
LAMIACEAE (Mint Family)						
Yerba buena	<i>Clinopodium douglasii</i>	H	FACU	N	3	
Pennyroyal	<i>Mentha pulegium</i>	H	OBL	I	2, 3	
Spearmint	<i>Mentha spicata</i>	H	FACW	I	2	
Self-heal	<i>Prunella vulgaris</i> var. <i>vulgaris</i>	H	FACU	I	2, 3	
Hedge nettle	<i>Stachys ajugoides</i>	H	OBL	N	3	
Mexican hedge nettle	<i>Stachys mexicana</i>	H	FACW	N	1, 2	
LINACEAE (Flax Family)						
Pale flax	<i>Linum bienne</i>	H	NL	I	2, 3	
LYTHRACEAE Loosestrife Family)						
Hyssop loosestrife	<i>Lythrum hyssopifolia</i>	H	OBL	I	2, 3	
MONTIACEAE (Miner's Lettuce Family)						
Candy flower	<i>Claytonia sibirica</i>	H	FAC	N	2	
MYRICACEAE (Wax Myrtle Family)						
Wax myrtle	<i>Morella californica</i>	T	FACW	N	2, 3	
MYRSINACEAE (Myrsine Family)						
Scarlet pimpernel	<i>Lysimachia arvensis</i>	H	FAC	I	3	
Pacific starflower	<i>Trientalis latifolia</i>	H	FACW	N	2	

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ONAGRACEAE (Evening Primrose Family)						
Fireweed	<i>Chamerion angustifolium</i> ssp. <i>circumvagum</i>	H	FACU	N	3	
Hairy willow herb	<i>Epilobium ciliatum</i>	H	FACW	N	2, 3	
OROBANCHACEAE (Broom-Rape Family)						
Parentucellia	<i>Parentucellia viscosa</i>	H	FAC	I	3	
OXALIDACEAE (Oxalis Family)						
Redwood sorrel	<i>Oxalis oregana</i>	H	FACU	N	3	
PHRYMACEAE (Lopseed Family)						
Tooth-leaved monkeyflower	<i>Erythranthe dentata</i>	H	OBL	N	2	
PLANTAGINACEAE (Plantain Family)						
Foxglove	<i>Digitalis purpurea</i>	H	FACU	I	3	
English plantain	<i>Plantago lanceolata</i>	H	FACU	I	1, 2, 3	
Common plantain	<i>Plantago major</i>	H	FAC	I	1, 2	
American brooklime	<i>Veronica americana</i>	H	OBL	N	2, 3	
POLYGONACEAE (Buckwheat Family)						
Sheep sorrel	<i>Rumex acetocella</i>	H	FACU	I	2, 3	
Curly dock	<i>Rumex crispus</i>	H	FAC	I	1, 2, 3	
Bitter dock	<i>Rumex obtusifolius</i>	H	FAC	I	2	
RANUNCULACEAE (Buttercup Family)						
California buttercup	<i>Ranunculus californicus</i>	H	FAC	N	3	
Creeping buttercup	<i>Ranunculus repens</i>	H	FAC	I	2, 3	
RHAMNACEAE (Buckthorn Family)						
Blue blossom	<i>Ceanothus thyrsiflorus</i>	S	NL	N	2, 3	
California coffeeberry	<i>Frangula californica</i> ssp. <i>californica</i>	S	NL	N	2, 3	
Cascara	<i>Frangula purshiana</i>	S	FAC	N	2	
ROSACEAE (Rose Family)						
Bride's feathers	<i>Aruncus dioicus</i> var. <i>acuminatus</i>	H	FACU	N	2	
Franchet's cotoneaster	<i>Cotoneaster franchetii</i>	S	NL	I	1, 2	
Oneseed hawthorn	<i>Crataegus monogyna</i>	S	FAC	I	2	
Wood strawberry	<i>Fragaria vesca</i>	H	FACU	N	1, 3	
Oregon crab apple	<i>Malus fusca</i>	T	FACW	N	2	
Oso berry	<i>Oemleria cerasiformis</i>	S	FACU	N	2	
Silverweed	<i>Potentilla anserina</i>	H	OBL	N	1, 2	
Cherry plum	<i>Prunus cerasifera</i>	T	NL	I	2	
Wood rose	<i>Rosa gymnocarpa</i> var. <i>gymnocarpa</i>	S	FACU	N	3	
Nootka rose	<i>Rosa nutkana</i>	S	FAC	N	2	
Himalayan blackberry	<i>Rubus armeniacus</i>	V	FAC	I	1, 2, 3	
Cut-leaved blackberry	<i>Rubus laciniatus</i>	S	FACU	I	2	
Whitebark raspberry	<i>Rubus leucodermis</i>	S	FACU	N	2, 3	

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Common Name/Family	Scientific Name	Growth Habit ¹	Wetland Indicator Status ²	Native Status ³	Source ⁴	Sensitivity / Listing Status ⁵
California blackberry	<i>Rubus ursinus</i>	V	FACU	N	1, 2, 3	
RUBIACEAE (Madder Family)						
Goose grass	<i>Galium aparine</i>	H	FACU	N	1, 2, 3	
Threepetal bedstraw	<i>Galium trifidum</i>	H	FACW	N	2	
SALICACEAE (Willow Family)						
Shining willow	<i>Salix lasiandra</i> var. <i>lasiandra</i>	S	FACW	N	1, 2	
Arroyo willow	<i>Salix lasiolepis</i>	T	FACW	N	1, 2, 3	
Sitka willow	<i>Salix sitchensis</i>	T	FACW	N	2, 3	
SAXIFRAGACEAE (Saxifrage Family)						
Tolmiea	<i>Tolmiea diplomenziesii</i>	H	FACW	N	2	
SCROPHULARIACEAE (Figwort Family)						
California figwort	<i>Scrophularia californica</i>	H	FAC	N	2, 3	
URTICACEAE (Nettle Family)						
Stinging nettle	<i>Urtica dioica</i>	H	FAC	N	1, 2, 3	
VIOLACEAE (Violet Family)						
Redwood violet	<i>Viola sempervirens</i>	H	NL	N	3	
ARACEAE (Arum Family)						
Duckweed	<i>Lemna minor</i>	H	OBL	N	1, 2, 3	
Yellow skunk-cabbage	<i>Lysichiton americanus</i>	H	OBL	N	1, 2, 3	
CYPERACEAE (Sedge Family)						
Wonder-woman sedge	<i>Carex gynodynama</i>	H	FAC	N	2	
Henderson's sedge	<i>Carex hendersonii</i>	H	FAC	N	3	
Slender-footed sege	<i>Carex leptopoda</i>	H	FAC	N	2	
Lyngbye's sedge	<i>Carex lyngbyei</i>	H	OBL	N	2, 3	2B.2
Slough sedge	<i>Carex obnupta</i>	H	OBL	N	1, 2, 3	
Small-bracted-sedge	<i>Carex subbracteata</i>	H	FACW	N	2	
Creeping spikerush	<i>Eleocharis macrostachya</i>	H	FACW	N	2, 3	
Panicled bulrush	<i>Scirpus microcarpus</i>	H	OBL	N	1, 2, 3	
IRIDACEAE (Iris Family)						
Douglas iris	<i>Iris douglasiana</i>	H	NL	N	2, 3	
JUNCACEAE (Rush Family)						
Toad rush	<i>Juncus bufonius</i>	H	FACW	N	2, 3	
Soft rush	<i>Juncus effusus</i>	H	FACW	N	1, 2, 3	
Dagger rush	<i>Juncus ensifolius</i>	H	FACW	N	2	
Coast rush	<i>Juncus hesperius</i>	H	FACW	N	1	
San Francisco rush	<i>Juncus lescurii</i>	H	FACW	N	2	
Mexican rush	<i>Juncus mexicanus</i>	H	FACW	N	2	
Western rush	<i>Juncus occidentalis</i>	H	FACW	N	2	
Irish-leaved rush	<i>Juncus xiphioides</i>	H	OBL	N	2	
Wood rush	<i>Luzula comosa</i>	H	FAC	N	3	
MELANTHIACEAE (False-hellborne Family)						
Western trillium	<i>Trillium ovatum</i> ssp. <i>ovatum</i>	H	FACU	N	3	

Plant Species Observed in the RT-102 Remediation Study Area

Common Name/Family	Scientific Name	Growth Habit ¹	Wetland Indicator Status ²	Native Status ³	Source ⁴	Sensitivity / Listing Status ⁵
POACEAE (Grass Family)						
Colonial bent grass	<i>Agrostis capillaris</i>	G	FAC	I	3	
Creeping bent grass	<i>Agrostis stolonifera</i>	G	FAC	I	1, 2, 3	
Silver hairgrass	<i>Aira caryophyllea</i>	G	FACU	I	2, 3	
Early hairgrass	<i>Aira praecox</i>	G	NL	I	2	
Water foxtail	<i>Alopecurus geniculatus</i>	G	OBL	N	2, 2	
Pacific foxtail	<i>Alopecurus saccatus</i>	G	FACW	N	3	
California sweet grass	<i>Anthoxanthum occidentale</i>	G	NL	N	3	
Sweet vernal grass	<i>Anthoxanthum odoratum</i>	G	FACU	I	1, 2, 3	
Slender wild oat	<i>Avena barbata</i>	G	NL	I	2, 3	
Cultivated oat	<i>Avena sativa</i>	G	UPL	I	3	
Rattlesnake grass	<i>Briza maxima</i>	G	NL	I	2	
Little quaking grass	<i>Briza minor</i>	G	FAC	I	2	
California brome	<i>Bromus carinatus</i>	G	NL	N	2	
Ripgut grass	<i>Bromus diandrus</i>	G	NL	I	3	
Soft chess	<i>Bromus hordeaceus</i>	G	FACU	I	2, 3	
Purple pampas grass	<i>Cortaderia jubata</i>	G	FACU	I	2	
Bristly dogtail grass	<i>Cynosurus echinatus</i>	G	NL	I	2, 3	
Orchard grass	<i>Dactylis glomerata</i>	G	FACU	I	3	
Blue wildrye	<i>Elymus glaucus</i> ssp. <i>glaucus</i>	G	FACU	N	2	
Tall fescue	<i>Festuca arundinacea</i>	G	NL	I	1, 2, 3	
Brome fescue	<i>Festuca bromoides</i>	G	NL	I	2	
Small ryegrass	<i>Festuca microstachys</i>	G	NL	N	2	
Rattail sixweeks grass	<i>Festuca myuros</i>	G	NL	I	3	
Western fescue	<i>Festuca occidentalis</i>	G	NL	N	2	
Rye grass	<i>Festuca perennis</i>	G	FAC	I	2, 3	
Fowl manna grass	<i>Glyceria elata</i>	G	FACW	N	2, 3	
Common velvet grass	<i>Holcus lanatus</i>	G	FAC	I	1, 2, 3	
Meadow barley	<i>Hordeum brachyantherum</i>	G	FACW	N	3	
Mediterranean barley	<i>Hordeum marinum</i> ssp. <i>gussoneanum</i>	G	FAC	I	2	
Reed canary grass	<i>Phalaris arundinacea</i>	G	FACW	N	2	
Cultivated timothy	<i>Phleum pratense</i>	G	FAC	I	2	
Annual blue grass	<i>Poa annua</i>	G	FAC	I	2	
Fowl blue grass	<i>Poa palustris</i>	G	FAC	I	2	
TYPHACEAE (Cattail Family)						
Broad-leaved cattail	<i>Typha latifolia</i>	H	OBL	N	1, 3	
² Wetland Indicator Status						
OBL = Obligate wetland species, occurs almost always in wetlands (>99% probability)						
FACW = Facultative wetland species, usually found in wetlands (67-99% probability)						
FAC = Facultative species, equally likely to occur in wetland and non-wetlands (34-66% probability)						

Plant Species Observed in the RT-102 Remediation Study Area

Common Name/Family	Scientific Name	Growth Habit ¹	Wetland Indicator Status ²	Native Status ³	Source ⁴	Sensitivity / Listing Status ⁵
FACU = Facultative upland species, not usually found in wetlands (1-33% probability) UPL = Upland species, almost never found in wetlands (<1% probability) NI = No indicator has been assigned due to a lack of information to determine indicator status NL = Not listed, assumed upland species						
⁵Sensitivity / Listing Status						
FE = Federal Endangered FT = Federal Threatened FC = Federal Candidate SE = California State Endangered ST = California State Threatened			1B.1 = Threatened in California and elsewhere, seriously threatened in California 1B.2 = Threatened in California and elsewhere, moderately threatened in California 2B = Plants rare, threatened, or endangered in California but more common elsewhere 3 = Plants about which more information is needed 4 = Plants of limited distribution			
⁴Source			¹Growth Habit		³Native Status	
1 = Padre Observed (Oct and Dec 2018 Surveys) 2 = Special Status Plant Survey (Stillwater Sciences, 2018) 3 = Biological Constraints Report (AMEC, 2013)			G = Grass H = Herb S = Shrub T = Tree		N = Native I = Introduced	

APPENDIX D

WILDLIFE SPECIES OBSERVED AT THE PG&E PIPELINE MAINTENANCE SITES

Wildlife Species Observed at the PG&E Pipeline Maintenance Project Sites

Common Name / Family	Scientific Name	Sensitivity / Listing Status ¹	R-354	R-519	RT-102
AMPHIBIANS					
HYLIDAE (Tree Frogs)					
Pacific Treefrog	<i>Pseudacris sierra</i>		X	X	X
RANIDAE (True Frogs)					
Northern Red-legged Frog	<i>Rana aurora</i>	CSC, FSS			X
REPTILES					
PHRYNOSOMATIDAE (spiny lizards)					
Western Fence Lizard	<i>Sceloporus occidentalis</i>		X		X
NATRICIDAE (live-bearing snakes)					
Western Aquatic Gartersnake	<i>Thamnophis atratus</i>				X
BIRDS					
Canada Goose	<i>Branta canadensis</i>	M	X		X
Gadwall	<i>Anas strepera</i>	M	X		
Mallard	<i>Anas platyrhynchos</i>	M	X		X
Ruddy Duck	<i>Oxyura jamaicensis</i>	M	X		
ODONTOPHORIDAE (New World Quail)					
California Quail	<i>Callipepla californica</i>				X
Mountain Quail	<i>Oreortyx pictus</i>				X
COLUMBIDAE (Pigeons and Doves)					
Band-tailed Pigeon	<i>Patagioenas fasciata</i>	M			X
Mourning Dove	<i>Zenaida macroura</i>	M	X		X
APODIDAE (Swifts)					
Vaux's Swift	<i>Chaetura vauxi</i>	M, CSC			X
TROCHILIDAE (Hummingbirds)					
Allen's Hummingbird	<i>Selasphorus sasin</i>	M			X
RALLIDAE (Rails, Gallinules, and Coots)					
Virginia Rail	<i>Rallus limicola</i>	M			X
RECURVIROSTRIDAE (Stilts and Avocets)					
Black-necked stilt	<i>Himantopus mexicanus</i>	M	X		
CHARADRIIDAE (Lapwings and Plovers)					
Killdeer	<i>Charadrius vociferus</i>	M	X		
SCOLOPACIDAE (Sandpipers, Phalaropes, and Allies)					
Greater Yellowlegs	<i>Tringa melanoleuca</i>	M	X		
PHALACROCORACIDAE (Cormorants)					
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	M, WL	X		
ARDEIDAE (Bitterns, Herons, and Allies)		M			
Great Blue Heron	<i>Ardea herodias</i>	M	X	X	X
Great Egret	<i>Ardea alba</i>	M	X	X	X
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	M	X		
CATHARTIDAE (New World Vultures)					
Turkey Vulture	<i>Cathartes aura</i>	M	X	X	X
ACCIPITRIDAE (Hawks, Kites, Eagles, and Allies)					
White-tailed Kite	<i>Elanus leucurus</i>	M, FP	X		
Northern Harrier	<i>Circus cyaneus</i>	M, CSC	X		
Red-shouldered Hawk	<i>Buteo lineatus</i>	M			X
Red-tailed Hawk	<i>Buteo jamaicensis</i>	M	X		
ALCEDINIDAE (Kingfishers)					

Wildlife Species Observed at the PG&E Pipeline Maintenance Project Sites

Common Name / Family	Scientific Name	Sensitivity / Listing Status ¹	R-354	R-519	RT-102
Belted Kingfisher	<i>Megaceryle alcyon</i>	M			X
PICIDAE (Woodpeckers and Allies)					
Hairy Woodpecker	<i>Picoides villosus</i>	M			X
Northern Flicker	<i>Colaptes auratus</i>	M			X
FALCONIDAE (Caracaras and Falcons)					
American Kestrel	<i>Falco sparverius</i>	M	X		
TYRANNIDAE (Tyrant Flycatchers)					
Pacific-slope Flycatcher	<i>Empidonax difficilis</i>	M		X	X
Black Phoebe	<i>Sayornis nigricans</i>	M	X	X	X
CORVIDAE (Jays and Crows)					
Steller's Jay	<i>Cyanocitta stelleri</i>	M			X
American Crow	<i>Corvus brachyrhynchos</i>	M	X		
Common Raven	<i>Corvus corax</i>	M	X		X
HIRUNDINIDAE (Swallows)					
Tree Swallow	<i>Tachycineta bicolor</i>	M	X	X	X
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	M	X		X
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	M	X		
Barn Swallow	<i>Hirundo rustica</i>	M	X	X	
PARIDAE (Chickadees and Titmice)					
Black-capped Chickadee	<i>Poecile atricapillus</i>	M, WL			X
Chestnut-backed Chickadee	<i>Poecile rufescens</i>	M			X
AEGITHALIDAE (Bushtits)					
Bushtit	<i>Psaltiriparus minimus</i>	M		X	X
TROGLODYTIDAE (Wrens)					
Marsh Wren	<i>Cistothorus palustris</i>	M	X		X
Bewick's Wren	<i>Thryomanes bewickii</i>	M			X
REGULIDAE (Kinglets)					
Ruby-crowned Kinglet	<i>Regulus calendula</i>	M			X
SYLVIIDAE (Sylviid Warblers)					
Wrentit	<i>Chamaea fasciata</i>		X		X
TURDIDAE (Thrushes)					
Hermit Thrush	<i>Catharus guttatus</i>	M			X
American Robin	<i>Turdus migratorius</i>	M		X	X
MIMIDAE (Mockingbirds and Thrashers)					
Northern Mockingbird	<i>Mimus polyglottos</i>	M	X		X
STURNIDAE (Starlings)					
European Starling	<i>Sturnus vulgaris</i>		X		
BOMBYCILLIDAE (Waxwings)					
Cedar Waxwing	<i>Bombycilla cedrorum</i>	M			X
PASSERIDAE (Old World Sparrows)					
House Sparrow	<i>Passer domesticus</i>		X		
FRINGILLIDAE (Fringilline and Cardueline Finches and Allies)					
House Finch	<i>Haemorhous mexicanus</i>	M	X		X
Lesser Goldfinch	<i>Spinus psaltria</i>	M	X		X
American Goldfinch	<i>Spinus tristis</i>	M	X	X	X
PARULIDAE (Wood-Warblers)					
Yellow Warbler	<i>Setophaga petechia</i>	M, CSC, BCC	X		X

Wildlife Species Observed at the PG&E Pipeline Maintenance Project Sites

Common Name / Family	Scientific Name	Sensitivity / Listing Status ¹	R-354	R-519	RT-102
Hermit Warbler	<i>Setophaga occidentalis</i>	M			X
Townsend's Warbler	<i>Setophaga townsendi</i>	M			X
Wilson's Warbler	<i>Cardellina pusilla</i>	M			X
EMBERIZIDAE (Emberizids)					
Savannah Sparrow	<i>Passerculus sandwichensis</i>	M	X		X
Song Sparrow	<i>Melospiza melodia</i>	M	X		X
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	M	X		X
Golden-crowned sparrow	<i>Zonotrichia atricapilla</i>	M	X		
Dark-eyed Junco	<i>Junco hyemalis</i>	M	X		X
CARDINALIDAE (Cardinals, Piranga Tanagers and Allies)					
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	M			X
ICTERIDAE (Blackbirds)					
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	M	X	X	
Brown-headed Cowbird	<i>Molothrus ater</i>	M	X		
MAMMALS					
SORCIDAE (Shrews)					
Vagrant Shrew	<i>Sorex vagrans</i>				X
LEPORIDAE (Rabbits and Hares)					
Brush Rabbit	<i>Sylvilagus bachmani</i>				X
Black-tailed Hare	<i>Lepus californicus</i>		X		
SCIURIDAE (Chipmunks, Squirrels, and Marmots)					
California Ground Squirrel	<i>Spermophilus beecheyi</i>		X		
Douglas' Squirrel	<i>Tamiasciurus douglasii</i>				X
CRICETIDAE (Deer Mice, Voles, and Relatives)					
California Vole	<i>Microtus californicus</i>		X		
CANIDAE (Foxes, Wolves, and Relatives)					
Coyote	<i>Canis latrans</i>		X		X
URSIDAE (Bears)					
Black Bear	<i>Ursus americanus</i>				X
PROCYONIDAE (Raccoons and Relatives)					
Raccoon	<i>Procyon lotor</i>				X
MUSTELIDAE (Weasels, Badgers, and Relatives)					
North American River Otter	<i>Lontra canadensis</i>		X		
CERVIDAE (Deer, Elk, and Relatives)					
Black-tailed Deer	<i>Odocoileus hemionus</i>		X		X
Sensitivity / Listing Status¹					
M = Protected under the federal Migratory Bird Treaty Act (MBTA) FE = Federally Endangered FT = Federally Threatened FDL = Federally Delisted FSS = Forest Service Sensitive BCC = USFWS Birds of Conservation Concern		SE = California State Endangered ST = California State Threatened CSC = California Species of Special Concern FP = California Fully Protected Species WL = CDFW Watch List			

APPENDIX E

PRELIMINARY AQUATIC RESOURCES DELINEATION MAPS FOR THE PG&E PIPELINE MAINTENANCE SITES

R-354 PRELIMINARY JURISDICTIONAL DELINEATION ACREAGE CALCULATIONS									
Feature	Wetland ID	Description	Length (ft)	OHWL Width (ft)	Area		Waters of US	Wetland	Total Acreage
					(ft2)	Acres			
Tidal Waters (Freshwater Slough)		Tidal slough				1.06	Yes	No	1.06
Channel 1 (Unnamed)		Intermittent Channel	26	8.0	208	0.005	Yes	Yes	0.01
Wetland 1	W1	Wet meadow				1.68	Yes	Yes	1.68
Wetland 2	W2	Tidal marsh				0.20	Yes	Yes	0.20
Wetland 3	W3	Wet meadow				0.28	Yes	Yes	0.28
Wetland 4	W4	Wet meadow				0.13	Yes	Yes	0.13
Wetland 5	W5	Wet meadow				0.11	Yes	Yes	0.11
Wetland 6	W6	Wet meadow				0.16	Yes	Yes	0.16
Wetland 7	W7	Nontidal Waters				0.02	Yes	Yes	0.02
Total									3.65

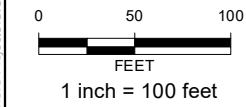
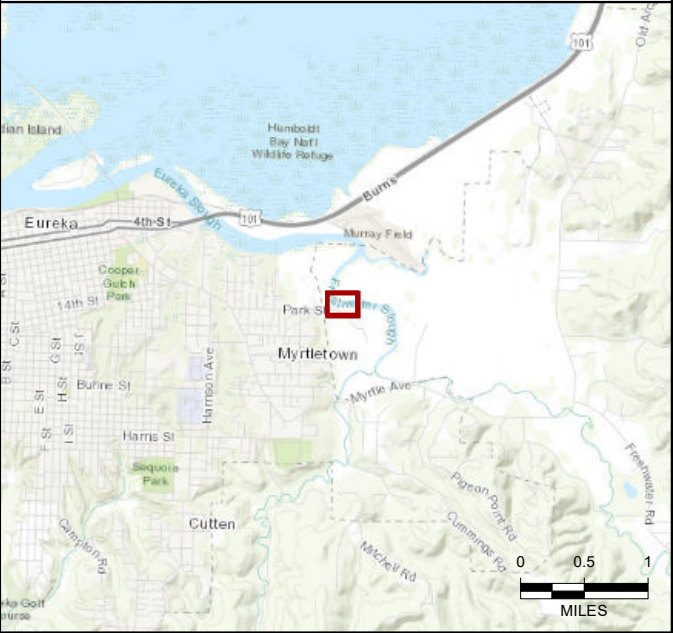


LEGEND:

- Upland Sample Plot Location
- Wetland Sample Plot Location
- Monterey Pine
- Control Point
- Mean High Tide Line
- Bridge Crossing
- Study Area (7.20 acres)
- Waters of the U.S. (3.65 acres)
 - Nontidal Waters (0.02 acres)
 - Tidal Marsh (0.20 acres)
 - Tidal Waters (1.06 acres)
 - Wet Meadow (2.36 acres)
 - Intermittent Channel (0.005ac)



MAP EXTENT:



Source: NAIP Imagery 2018
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E R-354 PIPELINE DECOMMISSIONING PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: November 2019

PRELIMINARY FEDERAL AQUATIC RESOURCES DELINEATION MAP

FIGURE 3A

R-354 PRELIMINARY JURISDICTIONAL DELINEATION ACREAGE CALCULATIONS									
Feature	Wetland ID	Description	Length (ft)	OHWM Width (ft)	Area		Waters of US	Wetland	Total Acreage
					(ft2)	Acres			
Tidal Waters (Freshwater Slough)		Tidal slough				1.06	Yes	No	1.06
Channel 1 (Unnamed)		Intermittent Channel	26	8.0	208	0.005	Yes	Yes	0.01
Wetland 1	W1	Wet meadow				1.68	Yes	Yes	1.68
Wetland 2	W2	Tidal marsh				0.20	Yes	Yes	0.20
Wetland 3	W3	Wet meadow				0.28	Yes	Yes	0.28
Wetland 4	W4	Wet meadow				0.13	Yes	Yes	0.13
Wetland 5	W5	Wet meadow				0.11	Yes	Yes	0.11
Wetland 6	W6	Wet meadow				0.16	Yes	Yes	0.16
Wetland 7	W7	Nontidal Waters				0.02	Yes	Yes	0.02
Total									3.65

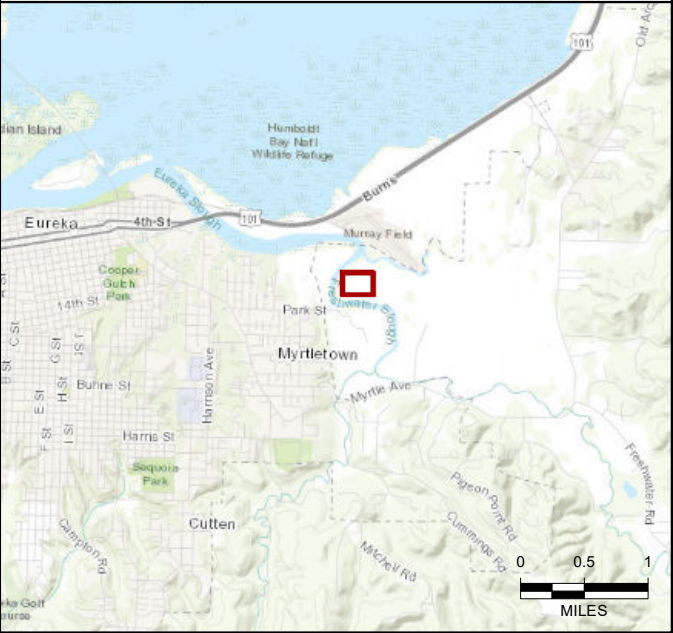


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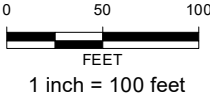
- Culvert
- Upland Sample Plot Location
- Wetland Sample Plot Location
- Control Point
- Edge of Road
- Study Area (7.20 acres)
- Waters of the U.S. (3.65 acres)
 - Nontidal Waters (0.02 acres)
 - Tidal Marsh (0.20 acres)
 - Tidal Waters (1.06 acres)
 - Wet Meadow (2.36 acres)
 - Intermittent Channel (0.005ac)



MAP EXTENT:



F:\GIS\Projects\GIS Maps\Map Project\PG&E Pipeline Projects\Eureka\Bundler\R354 Preliminary Federal Aquatic Resources Delineation Map.mxd - 11/14/2019



Source: NAIP Imagery 2018
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.

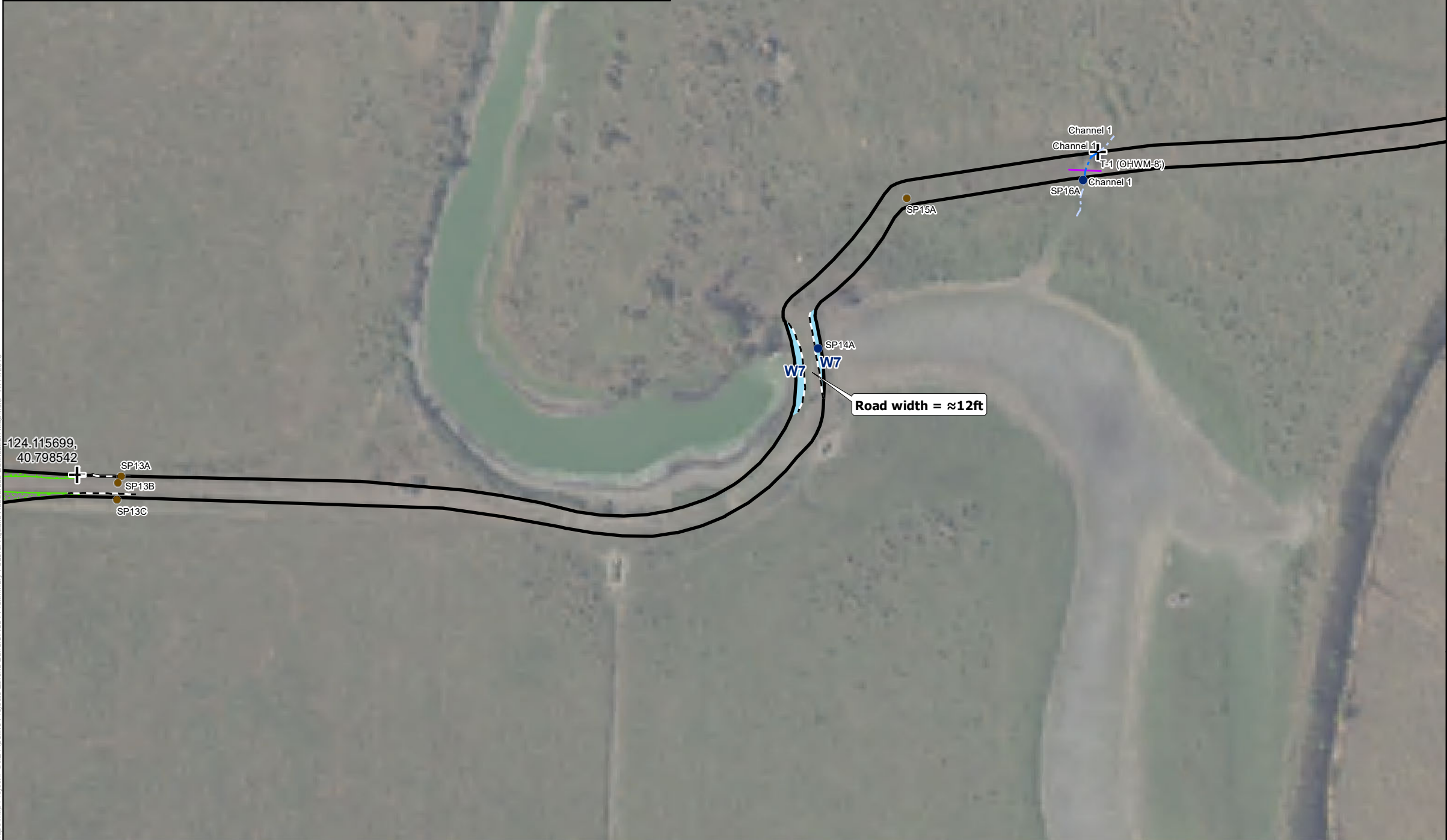


PROJECT NAME: PG&E R-354 PIPELINE DECOMMISSIONING PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: November 2019

PRELIMINARY FEDERAL AQUATIC RESOURCES DELINEATION MAP

FIGURE 3B

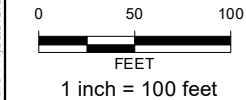
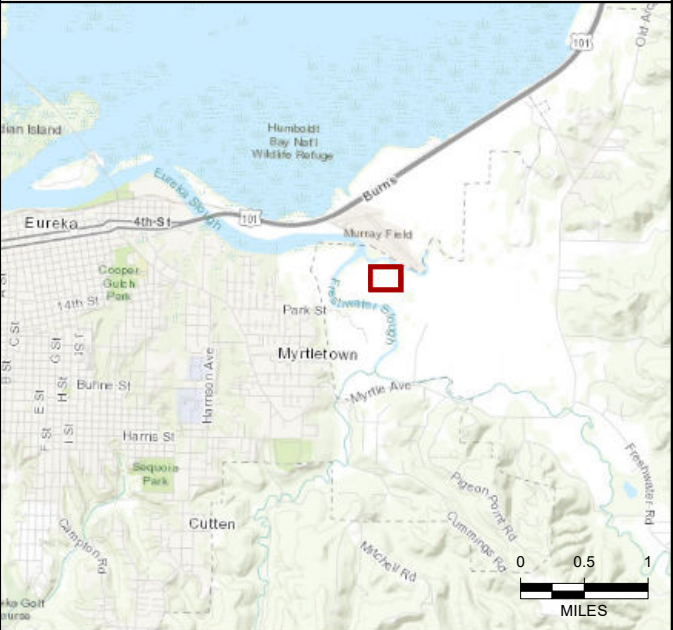
R-354 PRELIMINARY JURISDICTIONAL DELINEATION ACREAGE CALCULATIONS									
Feature	Wetland ID	Description	Length (ft)	OHWM Width (ft)	Area		Waters of US	Wetland	Total Acreage
					(ft2)	Acre			
Tidal Waters (Freshwater Slough)		Tidal slough				1.06	Yes	No	1.06
Channel 1 (Unnamed)		Intermittent Channel	26	8.0	208	0.005	Yes	Yes	0.01
Wetland 1	W1	Wet meadow				1.68	Yes	Yes	1.68
Wetland 2	W2	Tidal marsh				0.20	Yes	Yes	0.20
Wetland 3	W3	Wet meadow				0.28	Yes	Yes	0.28
Wetland 4	W4	Wet meadow				0.13	Yes	Yes	0.13
Wetland 5	W5	Wet meadow				0.11	Yes	Yes	0.11
Wetland 6	W6	Wet meadow				0.16	Yes	Yes	0.16
Wetland 7	W7	Nontidal Waters				0.02	Yes	Yes	0.02
Total									3.65



- LEGEND:**
- Upland Sample Plot Location
 - Wetland Sample Plot Location
 - Control Point
 - Transect
 - Edge of Road
 - Intermittent Channel Outside of Study Area
 - Study Area (7.20 acres)
 - Waters of the U.S. (3.65 acres)**
 - Nontidal Waters (0.02 acres)
 - Tidal Marsh (0.20 acres)
 - Tidal Waters (1.06 acres)
 - Wet Meadow (2.36 acres)
 - Intermittent Channel (0.005ac)



MAP EXTENT:



Source: NAIP Imagery 2018
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E R-354 PIPELINE DECOMMISSIONING PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: November 2019

PRELIMINARY FEDERAL AQUATIC
RESOURCES DELINEATION MAP

FIGURE
3C

R-354 PRELIMINARY JURISDICTIONAL DELINEATION ACREAGE CALCULATIONS									
Feature	Wetland ID	Description	Length (ft)	OHWM Width (ft)	Area		Waters of US	Wetland	Total Acreage
					(ft2)	Acres			
Tidal Waters (Freshwater Slough)		Tidal slough				1.06	Yes	No	1.06
Channel 1 (Unnamed)		Intermittent Channel	26	8.0	208	0.005	Yes	Yes	0.01
Wetland 1	W1	Wet meadow				1.68	Yes	Yes	1.68
Wetland 2	W2	Tidal marsh				0.20	Yes	Yes	0.20
Wetland 3	W3	Wet meadow				0.28	Yes	Yes	0.28
Wetland 4	W4	Wet meadow				0.13	Yes	Yes	0.13
Wetland 5	W5	Wet meadow				0.11	Yes	Yes	0.11
Wetland 6	W6	Wet meadow				0.16	Yes	Yes	0.16
Wetland 7	W7	Nontidal Waters				0.02	Yes	Yes	0.02
Total									3.65

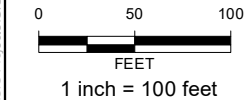
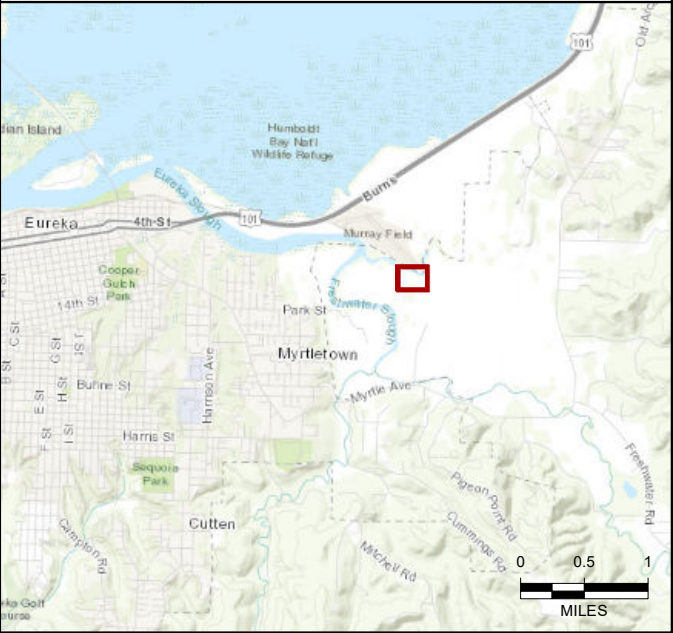


LEGEND:

- Culvert
- Edge of Road
- Upland Sample Plot Location
- Wetland Sample Plot Location
- Control Point
- Edge of Road
- Study Area (7.20 acres)
- Waters of the U.S. (3.65 acres)
 - Nontidal Waters (0.02 acres)
 - Tidal Marsh (0.20 acres)
 - Tidal Waters (1.06 acres)
 - Wet Meadow (2.36 acres)
 - Intermittent Channel (0.005ac)



MAP EXTENT:



Source: NAIP Imagery 2018
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.

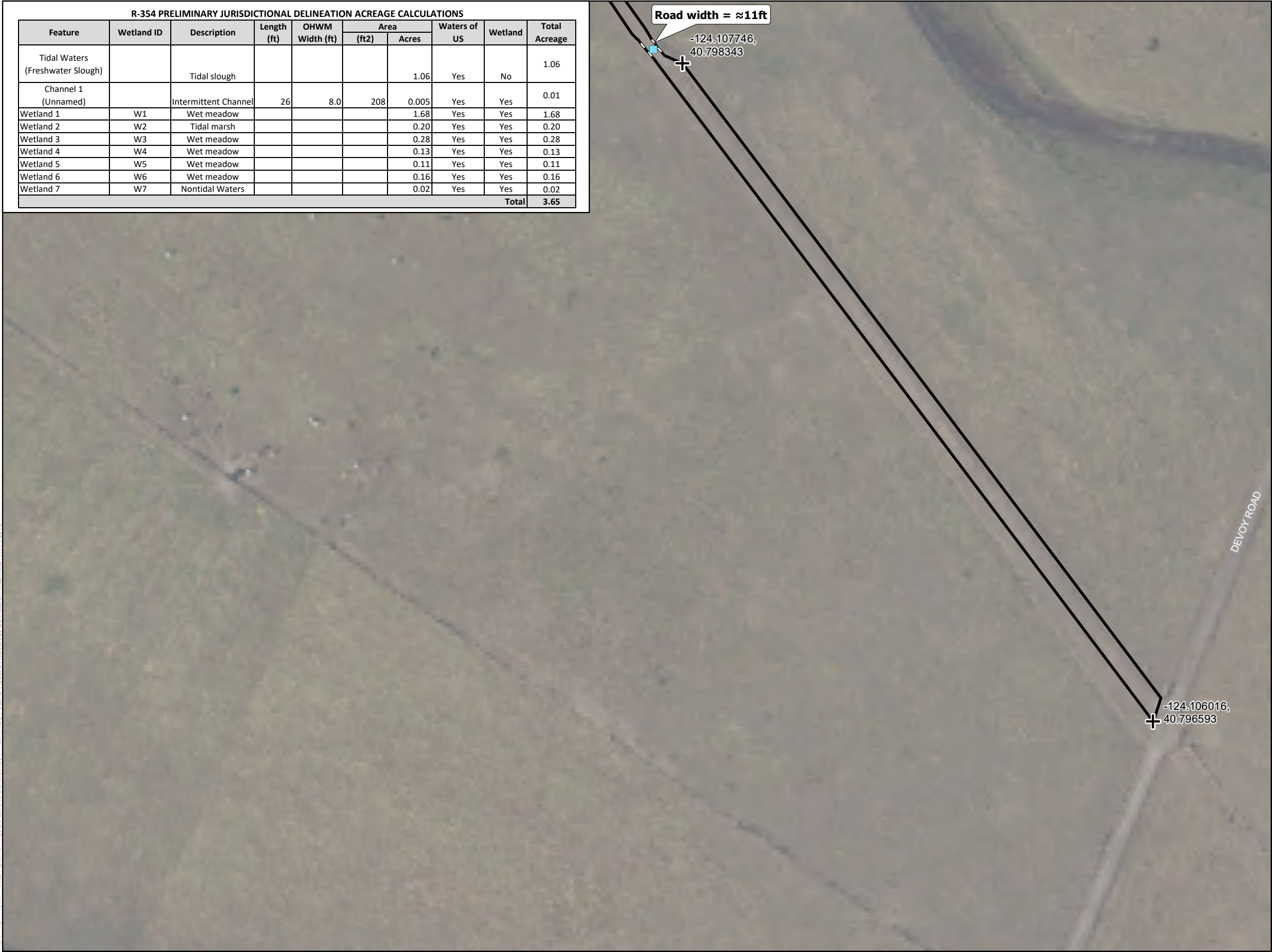


PROJECT NAME: PG&E R-354 PIPELINE DECOMMISSIONING PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: November 2019

PRELIMINARY FEDERAL AQUATIC RESOURCES DELINEATION MAP

FIGURE 3D

R-354 PRELIMINARY JURISDICTIONAL DELINEATION ACREAGE CALCULATIONS									
Feature	Wetland ID	Description	Length (ft)	OHWM Width (ft)	Area		Waters of US	Wetland	Total Acreage
					(ft2)	Acres			
Tidal Waters (Freshwater Slough)		Tidal slough				1.06	Yes	No	1.06
Channel 1 (Unnamed)		Intermittent Channel	26	8.0	208	0.005	Yes	Yes	0.01
Wetland 1	W1	Wet meadow				1.68	Yes	Yes	1.68
Wetland 2	W2	Tidal marsh				0.20	Yes	Yes	0.20
Wetland 3	W3	Wet meadow				0.28	Yes	Yes	0.28
Wetland 4	W4	Wet meadow				0.13	Yes	Yes	0.13
Wetland 5	W5	Wet meadow				0.11	Yes	Yes	0.11
Wetland 6	W6	Wet meadow				0.16	Yes	Yes	0.16
Wetland 7	W7	Nontidal Waters				0.02	Yes	Yes	0.02
Total									3.65

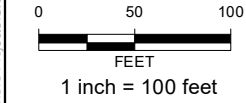


LEGEND:

- Culvert
- Control Point
- Edge of Road
- Study Area (7.20 acres)
- Waters of the U.S. (3.65 acres)
 - Nontidal Waters (0.02 acres)
 - Tidal Marsh (0.20 acres)
 - Tidal Waters (1.06 acres)
 - Wet Meadow (2.36 acres)
 - Intermittent Channel (0.005ac)



MAP EXTENT:



Source: NAIP Imagery 2018
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E R-354 PIPELINE DECOMMISSIONING PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: November 2019

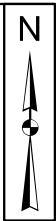
PRELIMINARY FEDERAL AQUATIC
RESOURCES DELINEATION MAP

FIGURE
3E

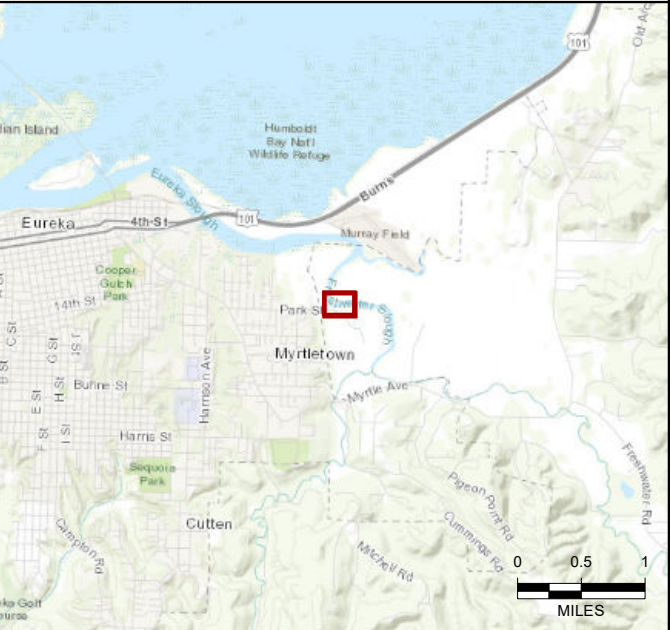


LEGEND:

- * Monterey Pine
- Sample Location
- + Control Point
- Mean High Tide Line
- ≡ Bridge Crossing
- Study Area (7.20 acres)
- Section 1600 Stream Feature - California Department of Fish & Wildlife (1.49 acres)
- State-Defined Wetland - California Coastal Commission (5.35 acres)
- Waters of the State - Regional Water Quality Control Board (3.65 acres)



MAP EXTENT:



Z:\GIS\Projects\GIS Maps\Map Project\PG&E Pipeline Projects\Eureka R-354 Pipeline State Aquatic Resources Delineation Map.mxd 11/12/2019

0 50 100
FEET
1 inch = 100 feet

Source: Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.

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associates, inc.
ENGINEERS, GEOLOGISTS &
ENVIRONMENTAL SCIENTISTS

PROJECT NAME: PG&E R-354 PIPELINE
DECOMMISSIONING PROJECT
EUREKA, CA

PROJECT NUMBER:
1702-2341

DATE:
November 2019

PRELIMINARY STATE AQUATIC
RESOURCES DELINEATION MAP

FIGURE
4A

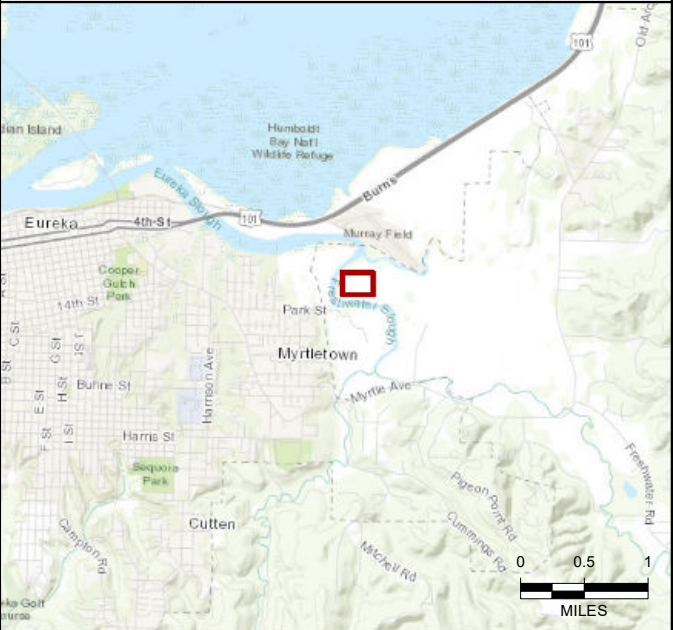


LEGEND:

- Sample Location
- + Control Point
- - Edge of Road
- Study Area (7.20 acres)
- Section 1600 Stream Feature - California Department of Fish & Wildlife (1.49 acres)
- State-Defined Wetland - California Coastal Commission (5.35 acres)
- Waters of the State - Regional Water Quality Control Board (3.65 acres)



MAP EXTENT:



Z:\GIS\Projects\GIS Maps\Map Project\PG&E Pipeline Projects\Eureka R-354 Pipeline State Aquatic Resources Delineation Map.mxd 11/12/2019

0 50 100
FEET
1 inch = 100 feet

Source: Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.

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ENVIRONMENTAL SCIENTISTS

PROJECT NAME: PG&E R-354 PIPELINE
DECOMMISSIONING PROJECT
EUREKA, CA
PROJECT NUMBER: 1702-2341
DATE: November 2019

**PRELIMINARY STATE AQUATIC
RESOURCES DELINEATION MAP**

**FIGURE
4B**

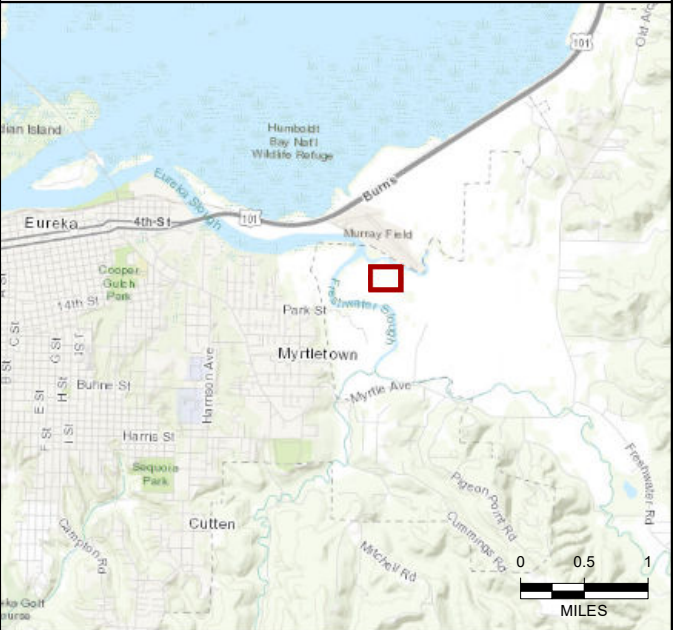


LEGEND:

- Sample Location
- + Control Point
- - Edge of Road
- Study Area (7.20 acres)
- Section 1600 Stream Feature - California Department of Fish & Wildlife (1.49 acres)
- State-Defined Wetland - California Coastal Commission (5.35 acres)
- Waters of the State - Regional Water Quality Control Board (3.65 acres)
- Intermittent Channel
- Intermittent Channel Outside of Study Area



MAP EXTENT:



Z:\GIS\Projects\GIS Maps\Map Project\PG&E Pipeline Projects\Eureka\BundlrR354 Preliminary State Aquatic Resources Delineation Map.mxd 11/12/2019

0 50 100
FEET
1 inch = 100 feet

Source: Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.

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ENVIRONMENTAL SCIENTISTS

PROJECT NAME: PG&E R-354 PIPELINE
DECOMMISSIONING PROJECT
EUREKA, CA
PROJECT NUMBER: 1702-2341
DATE: November 2019

PRELIMINARY STATE AQUATIC
RESOURCES DELINEATION MAP

FIGURE
4C

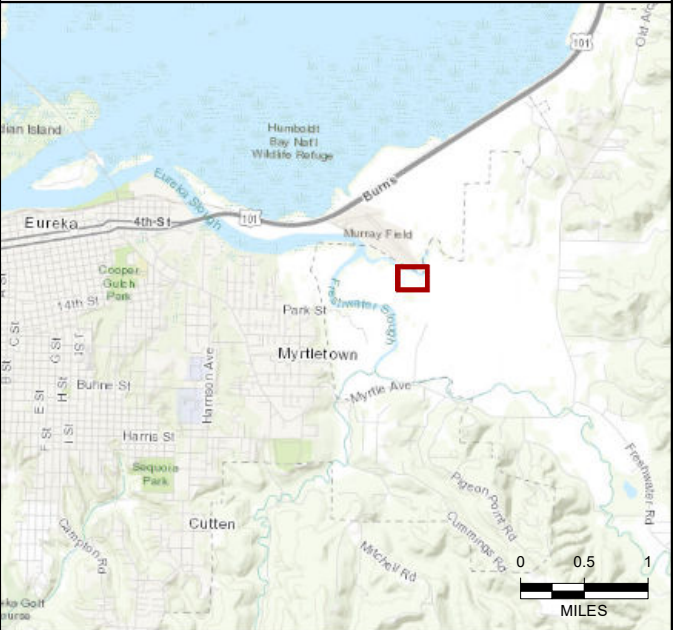


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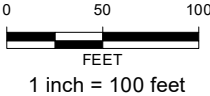
- Sample Location
- + Control Point
- Culvert
- - Edge of Road
- ▭ Study Area (7.20 acres)
- ▨ Section 1600 Stream Feature - California Department of Fish & Wildlife (1.49 acres)
- ▨ State-Defined Wetland - California Coastal Commission (5.35 acres)
- ▨ Waters of the State - Regional Water Quality Control Board (3.65 acres)



MAP EXTENT:



Z:\GIS\Projects\GIS Maps\Map Project\PG&E Pipeline Projects\Eureka\PG&E Pipeline State Aquatic Resources Delineation Map.mxd 11/12/2019



Source: Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E R-354 PIPELINE DECOMMISSIONING PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: November 2019

PRELIMINARY STATE AQUATIC RESOURCES DELINEATION MAP

FIGURE 4D

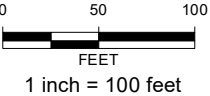
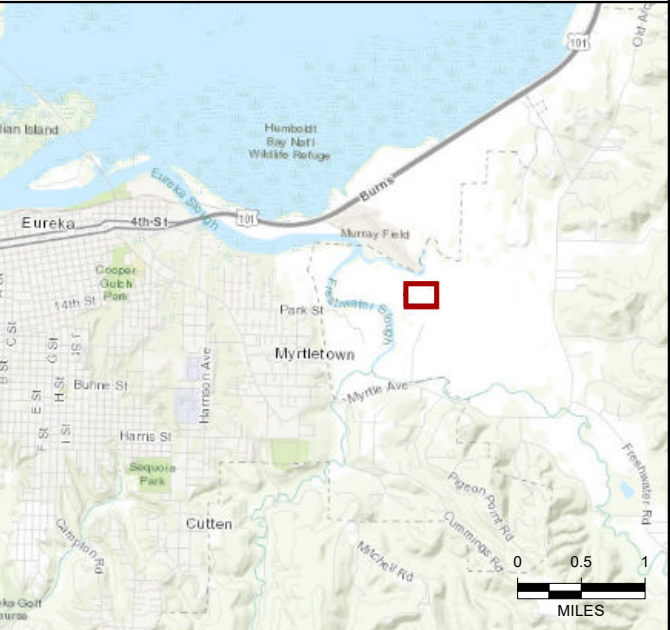


LEGEND:

- + Control Point
- Culvert
- - Edge of Road
- Study Area (7.20 acres)
- Section 1600 Stream Feature - California Department of Fish & Wildlife (1.49 acres)
- State-Defined Wetland - California Coastal Commission (5.35 acres)
- Waters of the State - Regional Water Quality Control Board (3.65 acres)



MAP EXTENT:



Source: Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



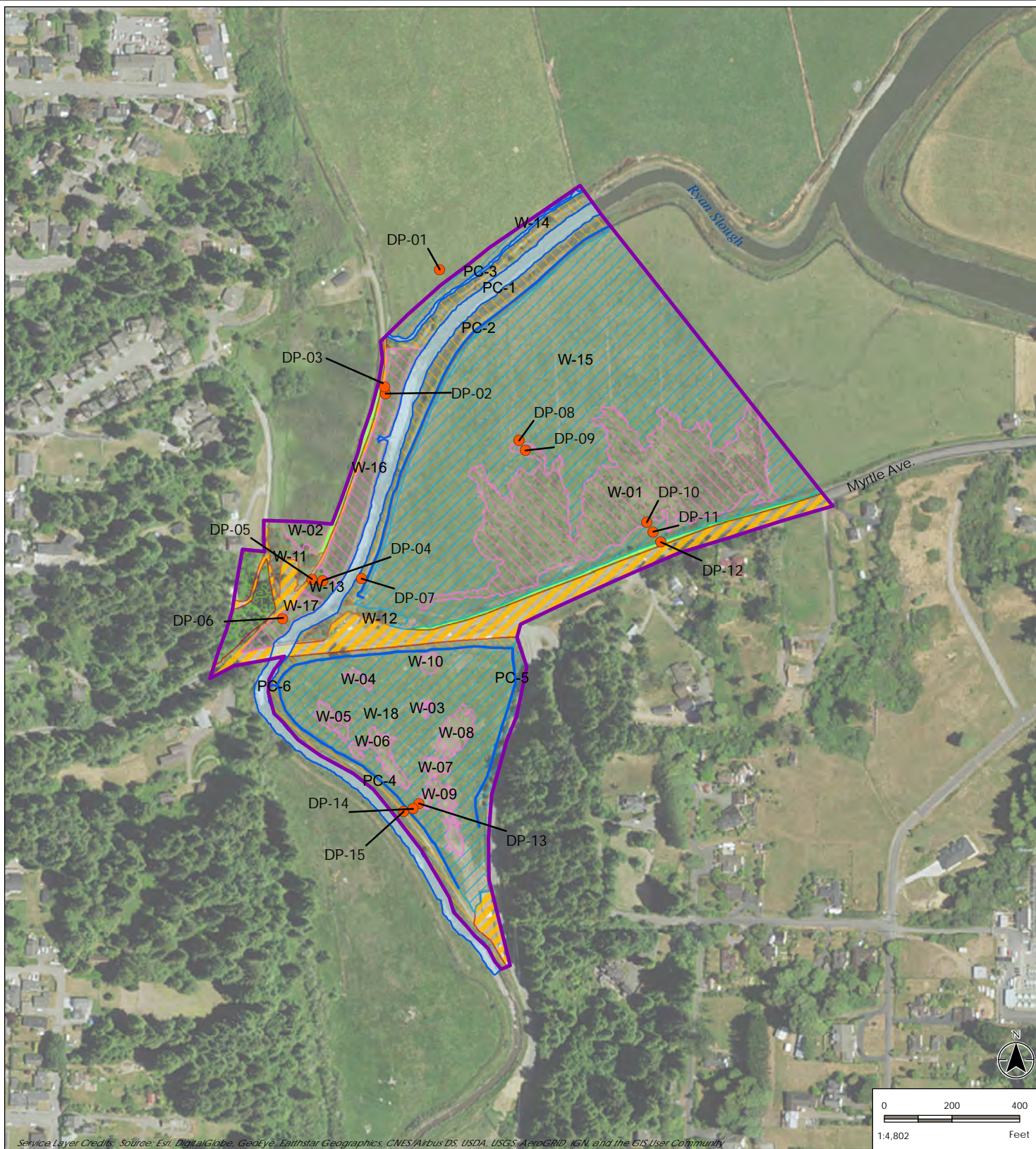
PROJECT NAME: PG&E R-354 PIPELINE
DECOMMISSIONING PROJECT
EUREKA, CA

PROJECT NUMBER:
1702-2341

DATE:
November 2019

PRELIMINARY STATE AQUATIC
RESOURCES DELINEATION MAP

FIGURE
4E



Legend

- | | | |
|---|---|--|
| Project Study Area (37.9 ac.) | Wet Meadow (19.8 ac.) | Douglas Fir Forest |
| ● Data Points | Willow Riparian Shrub (.69 ac.) | Perennial Rye Grass Fields |
| Waters of the U.S. | Land Cover Type | Rural Residential/Developed |
| Perennial Channels (2.9 ac.) | Annual Brome Grassland | |
| Perennial Emergent Wetland (7.9 ac.) | Developed | |

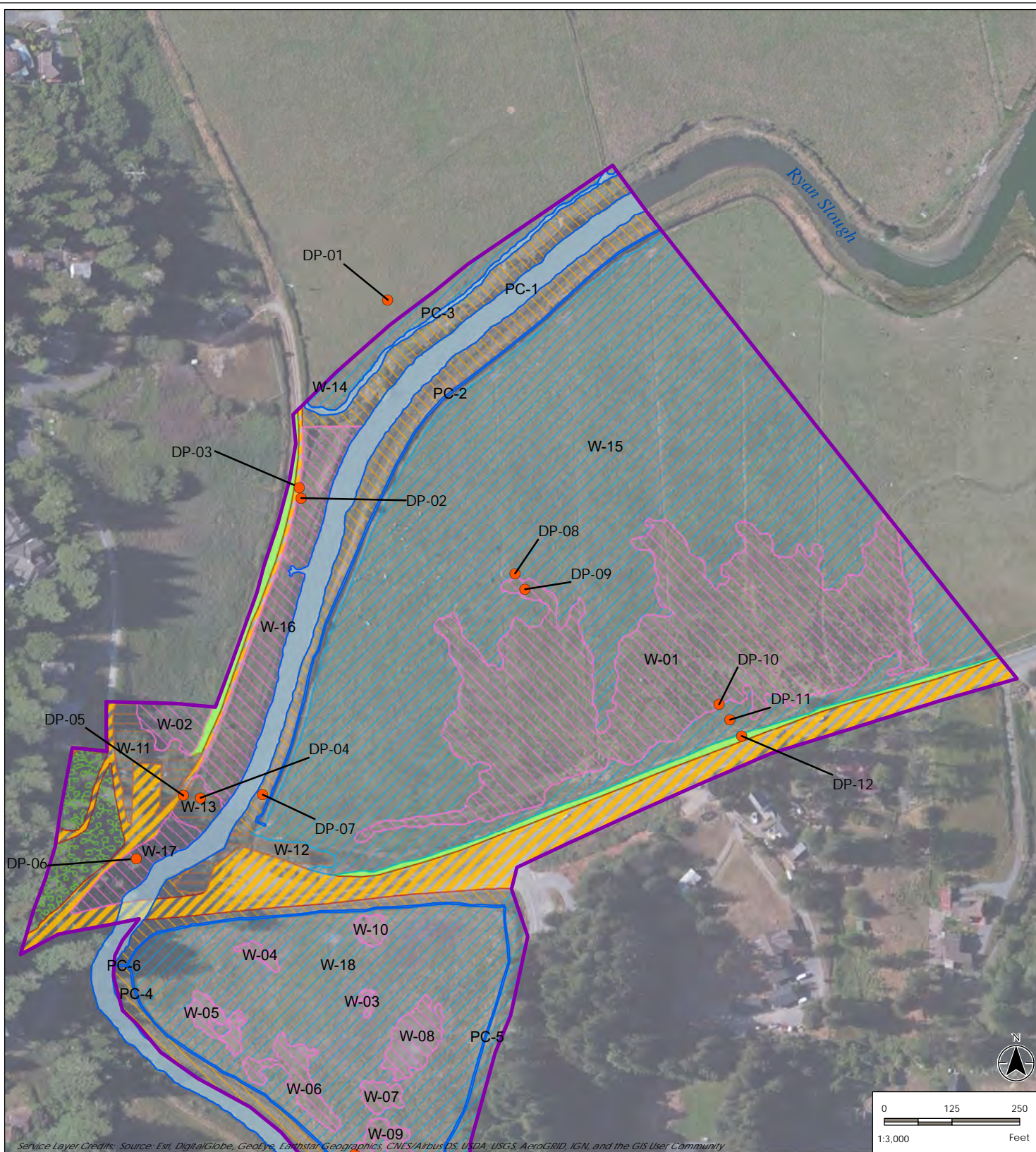


L137C Ryan Slough Crossing Replacement Project Preliminary Delineation of WOUS, Including Wetlands

Appendix B- Project Wetland Delineation Overview Map

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

Prepared: JIrook, 4/10/2017, Technical Review: LM, 2017-03-28, Independent Review: JH, 2017-03-28



Legend

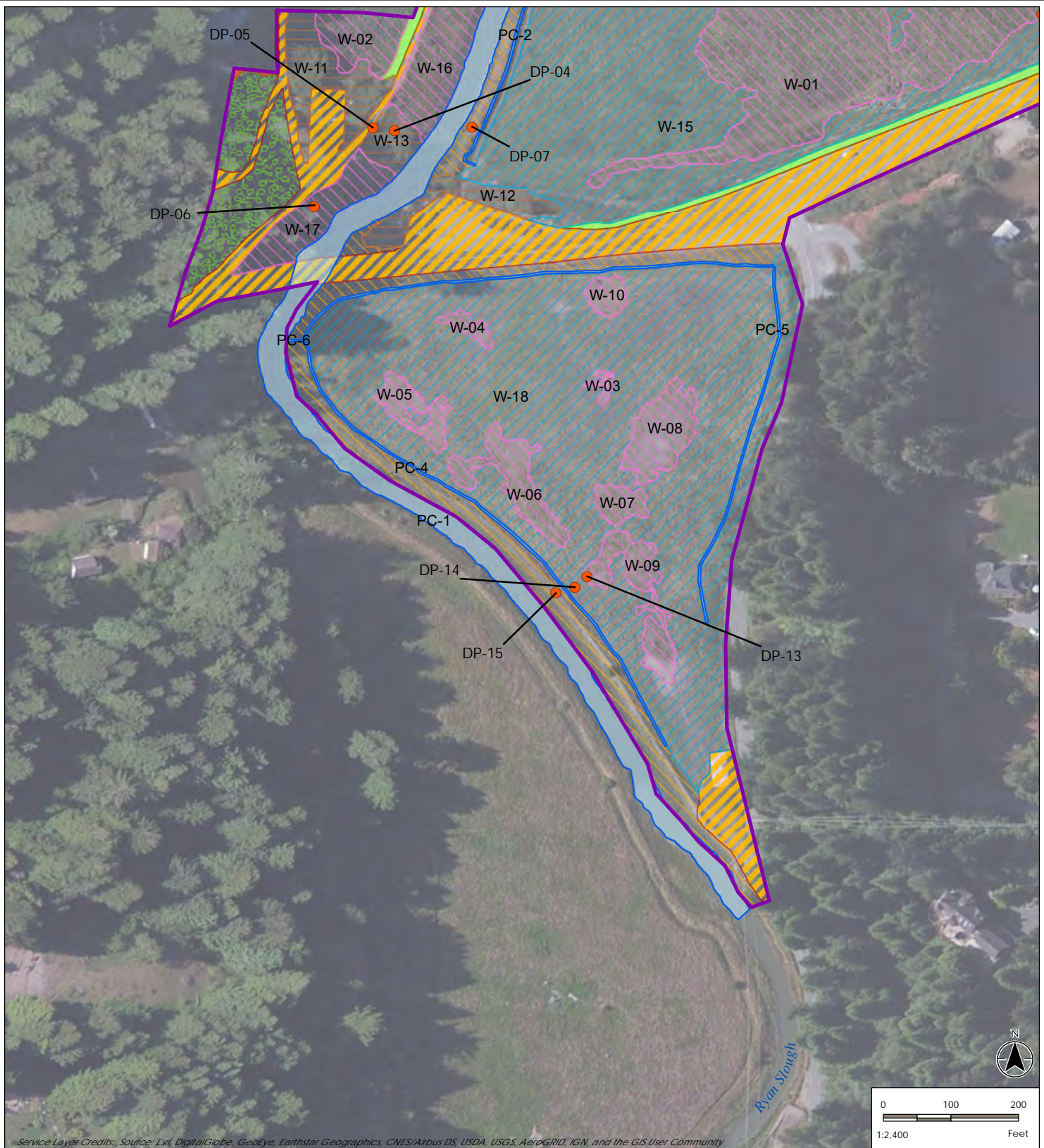
- | | | |
|---|--|--|
| Project Study Area (37.9 ac.) | Wet Meadow (19.8 ac.) | Douglas Fir Forest |
| ● Data Points | Willow Riparian Shrub (.69 ac.) | Perennial Rye Grass Fields |
| Waters of the U.S. | Land Cover Type | Rural Residential/Developed |
| Perennial Channels (2.9 ac.) | Annual Brome Grassland | |
| Perennial Emergent Wetland (7.9 ac.) | Developed | |



L137C Ryan Slough Crossing Replacement Project
Preliminary Delineation of WOUS, Including Wetlands

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Appendix B- Project Wetland Delineation Detailed Map North



Legend

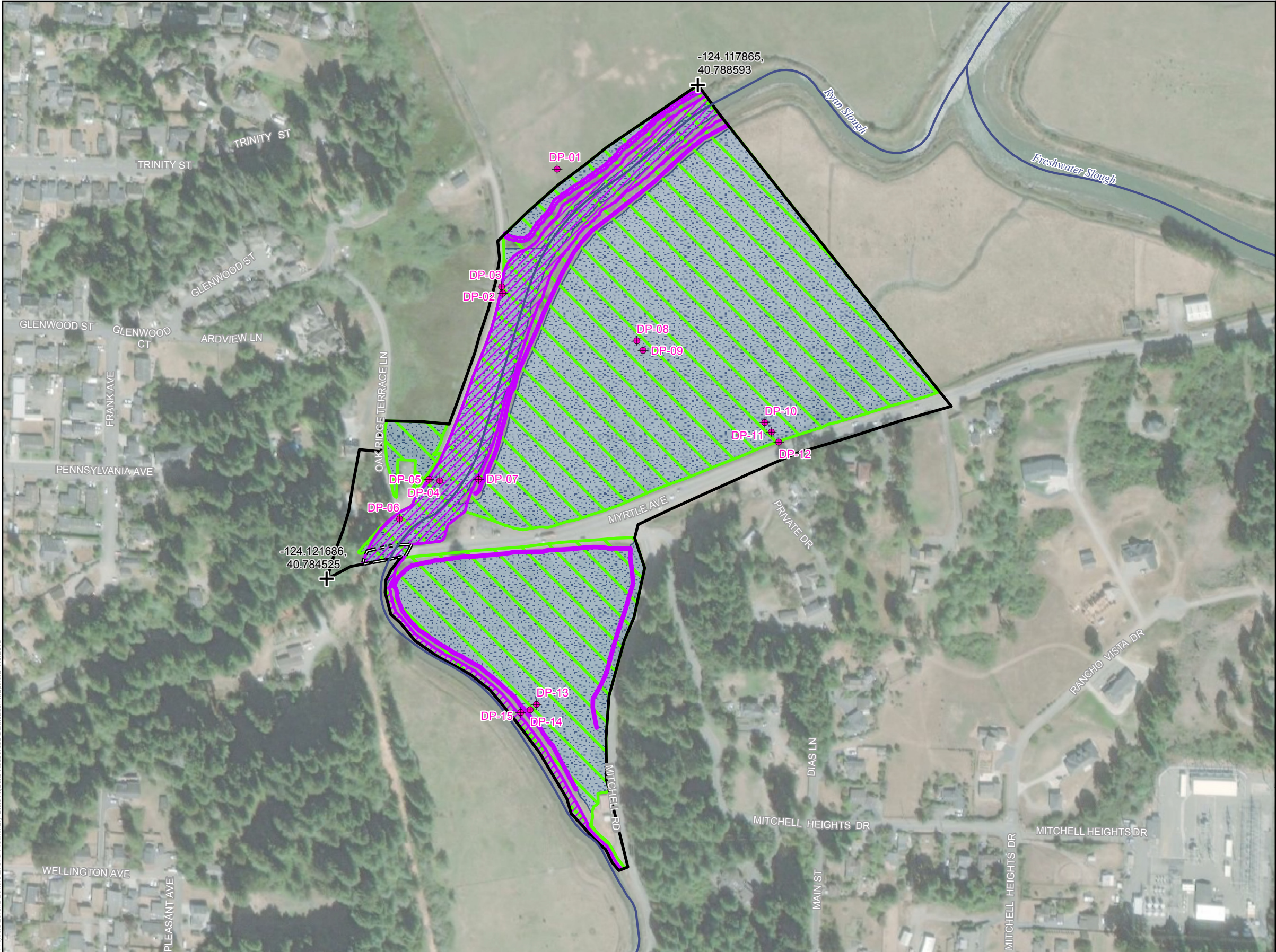
- | | | |
|---|--|--|
| Project Study Area (37.9 ac.) | Wet Meadow (19.8 ac.) | Douglas Fir Forest |
| ● Data Points | Willow Riparian Shrub (.69 ac.) | Perennial Rye Grass Fields |
| Waters of the U.S. | Land Cover Type | Rural Residential/Developed |
| Perennial Channels (2.9 ac.) | Annual Brome Grassland | |
| Perennial Emergent Wetland (7.9 ac.) | Developed | |



L137C Ryan Slough Crossing Replacement Project
Preliminary Delineation of WOUS, Including Wetlands

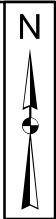
Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

Appendix B- Project Wetland Delineation Detailed Map South

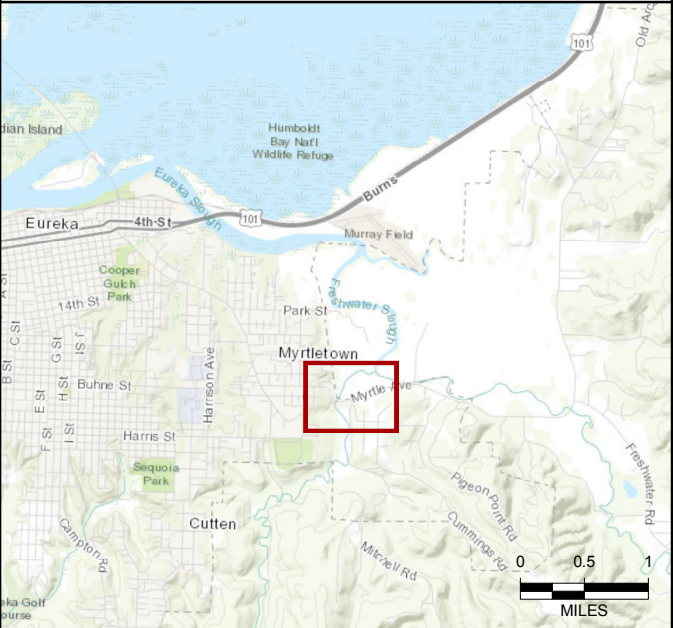


LEGEND:

- + Control Point
- ◆ Delineation Data Points (Stantec, 2017)
- ≡ Bridge Crossing
- ▭ Study Area (37.85 acres)
- ▨ Section 1600 Stream Feature - California Department of Fish & Wildlife (5.13 acres)
- ▨ State-Defined Wetland - California Coastal Commission (33.84 acres)
- ▨ Waters of the State - Regional Water Quality Control Board (30.42 acres)



MAP EXTENT:



Project: PG&E Pipeline Projects Eureka Bundle L137C Preliminary State Aquatic Resources Delineation Map.mxd 7/9/2019

0 150 300
FEET
1 inch = 300 feet

Source: Esri Online Basemap
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.

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PROJECT NAME: PG&E R-519 L137C
RYAN SLOUGH CROSSING PIPELINE REPLACEMENT PROJECT
EUREKA, CA
PROJECT NUMBER: 1702-2341
DATE: July 2019

PRELIMINARY STATE AQUATIC
RESOURCES DELINEATION MAP

FIGURE
2



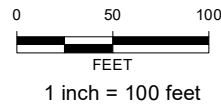
LEGEND:

- Sample Location
- ✚ Control Point
- Access Route
- ~ Wetland Swale
- Study Area (2.64 acres)
- State-Defined Wetland - California Coastal Commission (2.64 acres)
- Waters of the State - Regional Water Quality Control Board (1.05 acres)
- Perennial Channel (0.13 acres)

MAP EXTENT:



Z:\GIS\Projects\GIS Maps\Map Project\PG&E Pipeline Projects Eureka Bundle\RT-102 Preliminary State Aquatic Resources Delineation Map.mxd 1/14/2019



Source: NAIP Imagery 2018
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.

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PROJECT NAME: PG&E RT-102 REMEDIATION PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: November 2019

PRELIMINARY STATE AQUATIC
RESOURCES DELINEATION MAP

FIGURE
4B

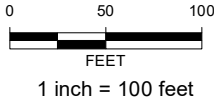


LEGEND:

- Sample Location
- + Control Point
- Access Route
- ~ Wetland Swale
- Study Area (2.64 acres)
- State-Defined Wetland - California Coastal Commission (2.64 acres)
- Waters of the State - Regional Water Quality Control Board (1.05 acres)
- Perennial Channel (0.13 acres)



MAP EXTENT:



Source: NAIP Imagery 2018
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E RT-102 REMEDIATION PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: November 2019

PRELIMINARY STATE AQUATIC
RESOURCES DELINEATION MAP

FIGURE
4C

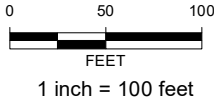


LEGEND:

- Sample Location
- Access Route
- Study Area (2.64 acres)
- State-Defined Wetland - California Coastal Commission (2.64 acres)
- Waters of the State - Regional Water Quality Control Board (1.05 acres)
- Perennial Channel (0.13 acres)



MAP EXTENT:



Source: NAIP Imagery 2018
Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
Notes: This map was created for informational and display purposes only.



PROJECT NAME: PG&E RT-102 REMEDIATION PROJECT EUREKA, CA	
PROJECT NUMBER: 1702-2341	DATE: November 2019

PRELIMINARY STATE AQUATIC
RESOURCES DELINEATION MAP

FIGURE
4D

APPENDIX F

CONCEPTUAL MITIGATION PLAN

MEMORANDUM

To: Pacific Gas & Electric Company
Attn: Sean Poirier – Senior Land Planner
Environmental Management – Gas Transmission
6111 Bollinger Canyon Rd., 3rd Floor (3110A)
San Ramon, California 94583

Project No: 1702-2341

cc: Mark Steffy – Longitude 123, Inc.

From: Sarah Powell – Senior Biologist

Date: September 23, 2019

Subject: PG&E Pipeline Maintenance Projects – Mitigation Concept

In April 2019, the PG&E project team participated in a pre-application meeting with the Humboldt Bay Harbor, Recreation, and Conservation District (Harbor District – CEQA Lead Agency), U.S. Army Corps of Engineers (Corps), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), California Department of Fish and Wildlife (CDFW), and California Coastal Commission (Coastal Commission) to introduce the Pacific Gas & Electric (PG&E) Pipeline Maintenance Projects – R-354 at Freshwater Slough Pipeline Decommissioning, R-519 Ryan Slough Pipeline Crossing Replacement, and RT-102 at Ryan Creek Pipeline Exposure Remediation. The intent of the inter-agency pre-application meeting was to introduce the project, discuss regulatory requirements, solicit agency feedback on project design, address agency questions or concerns, and ensure that the PG&E project team has the information necessary to prepare a comprehensive application package for agency review and approval. One of the primary topics of discussion in the inter-agency pre-application meeting was the need to develop compensatory mitigation proposal to address potential project related impacts. The Corps expressed a desire to coordinate early in the permitting process regarding the mitigation proposal so that potential mitigation options can be thoroughly vetted and preliminary mitigation concepts approved before submitting an application with a formal mitigation proposal. The intent of this correspondence is to outline the potential mitigation options explored and present a mitigation concept for further discussion and agency acceptance prior to development of a Mitigation Plan for formal approval during the project permit approval process.

During the pre-application meetings, the Harbor District indicated that the Dead Mouse Marsh (also known as the Park Street Marsh), located immediately adjacent to the R-354 Freshwater Slough Decommissioning Project Site, may have some capacity for additional mitigation and/or the potential for a funding contribution to support on-going marsh restoration projects at that site. The agencies expressed interest in this option, particularly because it was

located immediately adjacent to one of the Project sites (R-354) and within the Freshwater Slough watershed in which all of the maintenance project sites are located. The use of Dead Mouse Marsh, in some capacity, as mitigation for the PG&E Pipeline Maintenance Projects was the primary mitigation option explored because of this discussion in the inter-agency pre-application meeting and the proximity to the Project Sites within the same watershed. Options considered included the following:

1. Investigation of mitigation documentation to determine whether the existing mitigation site had excess acreage, unused as mitigation for the construction of Woodley Island Marina, and that would be directly available for use as mitigation for another project.
2. Review of the “freshwater marsh” portion of the site to determine what the current habitat condition of that feature is, and whether there was potential for additional wetland restoration or enhancement.
3. Review of the invasive species eradication effort currently underway for removal of the dense flowered cord grass (*Spartina densiflora*) (*Spartina*) from the Park Street Marsh to explore the potential for financial support of this effort as compensatory mitigation.
4. Review of the Humboldt Bay *Spartina* Eradication Plan (H.T. Harvey & Associates, 2012) to understand the regional focus on *Spartina* eradication and the importance of eradication of invasive species of *Spartina* to the coastal wetland habitat in the Humboldt Bay Region.

Review of Mitigation Documentation for the Park Street Marsh

The PG&E project team worked with the Harbor District to conduct a files and archives search in an attempt to locate any documentation associated with the use of the site as mitigation for the construction of the Woodley Island Marina. An approval letter from the California Coastal Commission dated April 26, 1979 was provided to the PG&E team and seems to be the only documentation of the use of the site as mitigation. The California Coastal Commission approval letter provides the following information regarding use of the Park Street Marsh as mitigation:

- The California Coastal Commission approved the use of the off-site mitigation generally described as the seventeen-acre parcel adjacent to Freshwater Slough at the foot of Park Street.
- The marsh would be restored to tidal action to compensate for loss of marsh, intertidal mudflat, and riparian habitat as a result of development of a marina complex at Woodley Island pursuant to Coastal Development Permit (CDP) No. NCR-76-C-369.
- Permit agencies requested that the two to three-acre freshwater marsh area at the southwest corner of the site remain intact and protected from the tidal action to continue function as freshwater marsh habitat.
- The Park Street Marsh site to be acquired and managed in accordance with the compensation plan was a total of 19.5 acres. Restoration of the site for use as mitigation involved the following modifications:

- The breach of an existing dike to return approximately 17 acres of the property to tidal action.
- Construction of an internal dike to prohibit inundation of adjacent lands and the freshwater marsh.
- Construction of a tide gate to allow drainage of the freshwater pond.
- Planting of riparian vegetation on two acres of “higher ground” on the southwest corner of the site.

The figures and exhibits referenced in the Coastal Commission approval were missing from the documentation provided. Additionally, the Coastal Commission Staff Summary references a Management Plan that was to be prepared and executed by the Harbor District, Department of Fish and Game, Coastal Commission, and U.S. Fish and Wildlife Service. The Management Plan was intended to address public access and fencing of the site, dike maintenance, educational studies related to the success of restoration, liability and maintenance of the site, and periodic review of the success of the restoration (California Coastal Commission, 1979). A search of Harbor District files did not locate a Management Plan for the Park Street Marsh. It is unknown whether a Management Plan was ever prepared or implemented for the Park Street Mitigation Site.

Although the Coastal Commission approval letter does not explicitly provide an accounting of the precise acreage for each habitat type within the Park Street Mitigation Site to be used as mitigation for the specific acreage of habitat lost as a result of the development of the Woodley Island Marina, there was no clear indication in any of the documentation provided that there was or was not unused acreage remaining in the Park Street Marsh that would be directly available for use as compensatory mitigation. However, according to information provided by the Harbor District, in addition to the 19.5 acre Park Street Marsh, they also own an adjoining parcel consisting of 1.05 acres of riparian habitat. No documentation was provided for the 1.05-acre site, and it's unclear whether that parcel was used as mitigation. Additionally, it was not entirely clear, based on the information outlined in the Coastal Commission approval and staff summary, whether the two to three-acre freshwater marsh was set aside from the 17 acre tidal restoration area or whether it was included as part of the mitigation for the CDP approval for construction of Woodley Island. In the Coastal Commission staff summary, it was simply acknowledged that the permit agencies requested that the freshwater marsh area in the southwest corner of the site be protected from tidal action so that it would continue to function as freshwater marsh habitat (California Coastal Commission, 1979). The Coastal Commission approval and staff summary are provided in Attachment 1.

Current Status of Park Street Marsh Management

The Park Street Marsh is owned by the Harbor District. As mentioned above, there is no record of a Management Plan for the Park Street Mitigation Site. The Harbor District is currently working with the Redwood Community Action Agency Natural Resource Services (RCAA NRS) to implement a *Spartina* eradication program and implement native marsh restoration in the Park Street Marsh and other properties owned by the Harbor District as part of a regional *Spartina*

eradication program. Based on discussions with RCAA NRS, the primary treatment for *Spartina* removal in the tidal marsh portion of the site has been completed with grant funding for marsh restoration. The grant funding allocated for this effort will only cover the cost of primary treatment (years 1 and 2) in the tidal marsh portion of the site. Currently, there is no funding available for follow-up treatments, typically needed in years 3, 4, and 5 for successful eradication of invasive *Spartina* (S. Manning, pers. Comm., 2019).

Conceptual Mitigation Proposal

Surveys conducted by Padre biologists in July 2019 of the Park Street Marsh, specifically focused on the freshwater marsh portion of the site, identified several high density populations of *Spartina* in the freshwater marsh and in an adjacent channel that are both part of the Park Street mitigation site and are not currently included in *Spartina* eradication program. The surveys conducted in July indicate that the portion of the site identified in mitigation documentation as the “freshwater marsh” is approximately 1.5 acres in size and includes a channel in the southeastern portion of the property (Figure 1). Both the freshwater marsh and the adjacent channel support high-density populations of invasive *Spartina*. The channel is immediately adjacent to the tidal marsh portion of the site currently receiving primary treatment for *Spartina* eradication, and the freshwater marsh is hydrologically connected to the tidal marsh through a culvert. This indicates that the *Spartina* population in both of these features are potential threats for reinvasion of the tidal marsh once *Spartina* eradication is complete in that portion of the site. Based on discussions with the RCAA NRS, the freshwater marsh portion of the site and the adjacent channel are not included in the current *Spartina* eradication efforts due to a lack of funding (S. Manning, pers. Comm., 2019). Additionally, funding is not secured for follow-up treatments in the tidal marsh portion of the site, indicating that reinvasion of invasive *Spartina* in that location could occur from recolonization by seedlings from the persistent seed bank and seed dispersal from adjacent untreated populations. Additional funding is needed to complete follow up treatment in years 3-5 in the tidal marsh portion of the site and for the addition of the freshwater marsh and channel sites to the *Spartina* eradication effort (treatment in years 1-3).

The RCAA NRS provided a cost estimate for the additional funding needed to complete follow-up treatments in the tidal marsh and for the addition of the freshwater marsh and channel areas to the *Spartina* eradication effort. The additional funding necessary for *Spartina* eradication throughout the Park Street Mitigation Site is approximately \$181,121.00.

The RCAA NRS has the regulatory permits necessary to complete *Spartina* eradication throughout the Park Street Mitigation site. The RCAA NRS has provided a description of their treatment plan and methodology, goals and objectives identified for marsh restoration, and monitoring and performance criteria established for documentation of successful eradication (Attachment 2). *Spartina* eradication within the additional 1.5-acre freshwater marsh and channel portion of the site would be subject to the same treatment methodology and performance criteria outlined in the RCAA NRS description and would be covered by the existing regulatory permits and Programmatic Environmental Impact Report for the Humboldt Bay Regional *Spartina* Eradication Plan (H.T. Harvey & Associates and GHD, 2012). PG&E proposes to contribute the additional funding needed for full eradication of *Spartina* from the Park Street Marsh. Because

the *Spartina* eradication and marsh restoration is currently underway, but not fully funded and not inclusive of the freshwater marsh and channel portions of the site, the PG&E funding would contribute to the marsh restoration effort immediately and prior to the occurrence of the wetland impacts associated with the PG&E Pipeline Maintenance Projects, which are expected to occur in late 2020.

Based on preliminary project planning for the PG&E Pipeline Maintenance Projects, and current 60 percent design plans, the estimated impact resulting from the PG&E project is approximately 0.1-acre of permanent impacts to federal and state jurisdictional wetlands. PG&E proposes to provide a funding contribution of \$181,121.00 to complete the *Spartina* eradication from the Park Street Mitigation Site.

Basis for Mitigation Concept

There is a regional focus on *Spartina* eradication throughout Humboldt Bay to improve the habitat function of salt marshes currently dominated by the invasive *Spartina* and prevent further degradation of remaining salt marsh habitat. *Spartina* eradication in the Humboldt Bay Region is needed to restore sensitive coastal wetland habitat and prevent the spread of invasive *Spartina* to other estuaries on the west coast (H.T. Harvey, 2012). Invasion of *Spartina* into coastal salt marsh habitat modifies community structure and can alter nutrient cycling, marsh productivity, hydrology, and habitat availability. Dense *Spartina* growth decreases tidal flow and increases sediment trapping which can result in increased marsh elevations and subsequent changes to species composition and loss of wetlands (H.T. Harvey, 2012).

Invasive *Spartina* has affected the Park Street Marsh since the 1980s. A literature review conducted in 2002 discussed the spread of invasive *Spartina* throughout the Humboldt Bay. This document specifically looked at four restoration projects in the region, including the Park Street Marsh, and reviewed a masters thesis study conducted by Claycomb (1983) that indicates an increase of 20 percent cover of *Spartina densiflora* that occurred in the Park Street Marsh between 1979 and 1982. This study also predicted that *Spartina* marsh would eventually cover much of the mitigation area (the tidal marsh area that was restored when the dike was breached). A review of the Park Street Marsh Site in 2002 indicated that *Spartina densiflora* had become the dominant species within the tidal marsh (Clifford, 2002).

The Humboldt Bay Regional *Spartina* Eradication Plan provides a mechanism for prioritizing sites for *Spartina* treatment based on the following attributes: 1) Maintenance level status, 2) Vulnerability, 3) Propagule pressure, and 4) Containment. The Park Street Mitigation Site with its current level of planned treatment receives a high priority rating when measured against each of these attributes. Following is a discussion of each attribute related to the specific site conditions at the Park Street Mitigation Site and the resulting priority level ratings:

Maintenance Level Status

Sites that have received intensive *Spartina* eradication treatments are a high priority for continued maintenance level treatments on all restored lands to prevent *Spartina* reinvasion. The Park Street Mitigation Site has received primary treatment in the tidal marsh portion of the site (17 acres) but does not currently have funding for follow-up treatments. When measured against

this attribute, it is a high priority to continue treatment at the Park Street Mitigation Site to complete *Spartina* eradication and salt marsh restoration efforts.

Vulnerability

Sites that are vulnerable to invasion by *Spartina* are a high priority for treatment. The site disturbance associated with primary treatment for *Spartina* in the tidal marsh portion of the Park Street Mitigation Site increases its vulnerability to reinvasion from the persistent *Spartina* seed bank due to the recent disturbance of primary treatment and available space for colonization of new seedlings. When measured against this attribute, it is a high priority for continued treatment at the Park Street Mitigation Site throughout the vulnerable period until native vegetation becomes established and reduces site vulnerability through canopy closure.

Propagule Pressure

Sites with a high number of propagules present and their potential to reach new locations are a high priority for treatment. Propagule pressure is a major factor influencing invasion of natural communities and a persistent seed bank poses the greatest threat to treated sites, followed by onsite or nearby reproductive populations (H.T. Harvey, 2012). The Park Street Mitigation Site has propagule pressure both in the form of persistent seed bank in the tidal marsh area that has received primary treatment and in the form of nearby reproductive populations in the portions of the site not currently undergoing treatment (e.g. the fresh water marsh and channel portions of the site). When measured against this attribute, it is a high priority to continue treatment in the tidal marsh portion of the Site and include the untreated portions of the site in the *Spartina* eradication efforts at this site to eliminate propagule pressure from persistent seed bank and nearby reproductive populations.

Containment

Containment refers to the ability to completely remove *Spartina* populations within specific geographic locations. The lower the infested acreage remaining within a given area, the higher the potential is for containing the infestation, and the higher the priority for treatment. The Park Street Mitigation Site, if entirely included in *Spartina* eradication efforts and fully funded for the duration of the treatment effort through the proposed PG&E funded portion of the mitigation, could result in complete removal of the *Spartina* population within the site and containment of the *Spartina* infestation at the Site.

Because the Park Street Mitigation Site ranks highly for all of the above outlined prioritization attributes, every effort should be made to complete the *Spartina* eradication program at the site and to treat all infestations at the site. This would include the completion of both primary and follow-up treatments of the tidal marsh portion of the site as well as treatment of the freshwater marsh and channel populations of invasive *Spartina*. Funding is not available for the full *Spartina* eradication effort; however, PG&E proposes to provide funding for the remainder of the *Spartina* eradication effort through a financial contribution made as compensatory mitigation for the permanent impact of approximately 0.1-acre of wetlands associated with the Pipeline Maintenance Projects.

A financial contribution to fund the completion of the *Spartina* eradication program at the Park Street Mitigation Site will help meet regional goals of invasive species eradication in

Humboldt Bay, improve the species diversity of the coastal wetland habitat at the Park Street Mitigation Site, restore the topography and hydrology of the tidal marsh and freshwater marsh components of the site, restore the native vegetation cover, and improve the food web contributions and habitat value of the coastal wetlands to fish and wildlife resources throughout the Freshwater Slough watershed.

REFERENCES

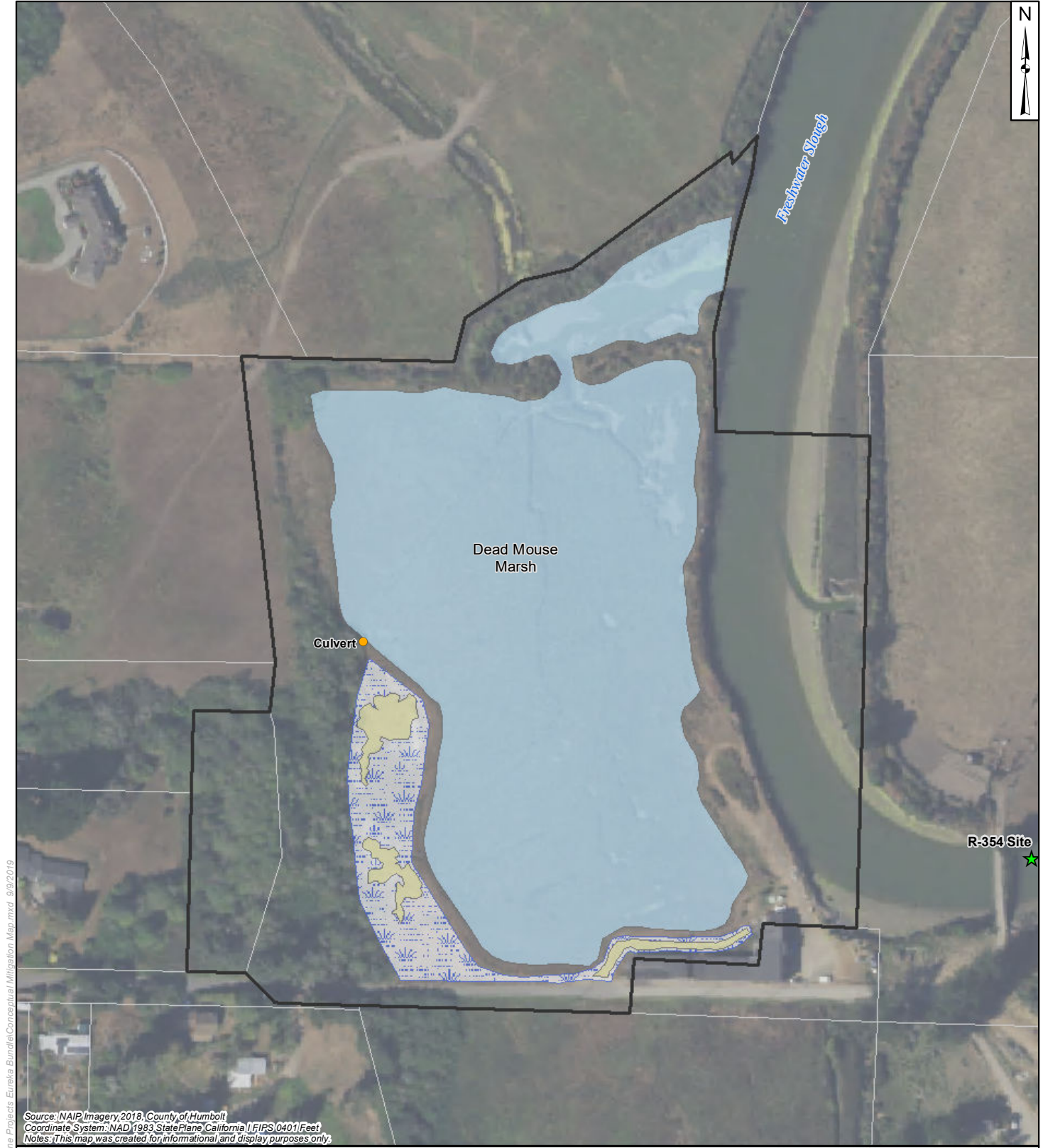
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- California Coastal Commission. 1979. Commission approval of the off-site mitigation as partial requirement of NCR-76-C-369 Coastal Development Permit for the Woodley Island Marina. Approval letter dated April 26, 1979.
- Claycomb, D.W. 1983. Vegetational Changes in a Tidal Marsh Restoration Project at Humboldt Bay, California. M.A. thesis. Humboldt State University. Arcata California.
- Clifford, Patti M. 2002. Dense-flowered cordgrass (*Spartina densiflora*) in Humboldt Bay, Summary and Literature Review. Prepared for the California State Coastal Conservancy. January 2, 2002.
- H.T. Harvey & Associates. 2012. Draft Humboldt Bay Regional *Spartina* Eradication Plan. Prepared for the California State Coastal Conservancy. November 14, 2012.
- H.T. Harvey & Associates and GHD. 2012. Draft Programmatic Environmental Impact Report for the Humboldt Bay Regional *Spartina* Eradication Plan. Prepared for the California State Coastal Conservancy. November 20, 2012.

PERSONAL COMMUNICATIONS

- Manning, Susannah. Redwood Community Action Agency, Natural Resource Services. July 22, 2019. Telephone conversation with Sarah Powell of Padre Associates, Inc. regarding *Spartina* eradication efforts in the Park Street Marsh.

FIGURES



Source: NAIP Imagery, 2018, County of Humboldt
 Coordinate System: NAD 1983 StatePlane California I FIPS 0401 Feet
 Notes: This map was created for informational and display purposes only.

LEGEND:

- ★ R-354 Site
- Culvert
- ▭ Assessor Parcel Boundary
- ▭ Property Boundary (Harbor District Ownership)
- ▨ Freshwater Marsh
- ▨ Spartina Populations (Untreated)
- ▨ Tidal Marsh (Primary Spartina Treatment Only)

0 100 200
 FEET
 1 in = 200 ft

padre associates, inc. ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS	PROJECT NAME: PG&E EUREKA PIPELINE PROJECTS EUREKA, CA		CONCEPTUAL MITIGATION MAP FIGURE 1
	PROJECT NUMBER: 1702-2341	DATE: September 2019	

Z:\GIS Projects\GIS Maps\Map Project\PG&E Pipeline Projects Eureka Bundle\Conceptual Mitigation Map.mxd 9/9/2019

ATTACHMENT 1

CALIFORNIA COASTAL COMMISSION APPROVAL LETTER

CALIFORNIA COASTAL COMMISSION

NORTH COAST REGION

1656 UNION STREET, ROOM 150

P.O. BOX 4946

EUREKA, CALIFORNIA 95501

(707) 443-1623



April 26, 1979

Mr. Jack Alderson
Humboldt Bay Harbor, Recreation,
and Conservation District
P.O. Box 134
Eureka, California 95501

RE: NCR-76-C-369

Dear Mr. Alderson:

The commission at its April 12, 1979 public hearing in Point Arena approved the off-site mitigation pursuant as a partial requirement of condition four of NCR-76-C-369. The commission amended item F in the staff summary. That amended item is attached to the enclosed staff summary.

The above approval represents the final requirement of NCR-76-C-369 relative to issuance of the permit. The permit is hereby issued as of the date of this letter.

Sincerely,

A handwritten signature in dark ink, appearing to read "Richard G. Rayburn".

RICHARD G. RAYBURN
Executive Director

RGR:lp
enc.

STAFF SUMMARY
WOODLEY ISLAND MARINA
OFF-SITE MITIGATION

I. APPLICATION:

Name: Humboldt Bay Harbor Recreation
and Conservation District
P.O. Box 134
Eureka, California 95501

Number: NCR-76-C-369
Approved: December 8, 1976

Agent: Winzler & Kelly, Consulting Engineers
P.O. Box 1345
Eureka, California 95501

II. DEVELOPMENT SUMMARY:

Review of off-site mitigation pursuant to approved permit for construction of a marina complex at Woodley Island.

III. LOCATION:

South side of Woodley Island, City of Eureka.

IV. STAFF RECOMMENDATION

a) Approval of district proposed off-site mitigation:

The commission hereby grants approval of the off-site mitigation generally described as the seventeen acre parcel adjacent to Fresh-water Slough at the foot of Park Street and as shown on maps with Exhibit A. The off-site mitigation is a requirement of condition four of NCR-76-C-369 which states that: "The issuance of the permit is contingent upon selection of off-site 15-20 acres by applicant, and the ratification of the off-site selection by North Coast Regional Coastal Commission, or its successor, which shall thereafter be restored to full tidal action to compensate for the loss of marsh, intertidal mudflats, and riparian habitat, as a result of the development pursuant to this permit. Applicant shall execute a development and management plan in cooperation with the Department of Fish and Game and ratified by the North Coast Regional Coastal Commission or its successor agency for restoration of the land to full tidal action and retention perpetually for fish and wildlife purposes. All cost of acquisition, development, and maintenance of the land to be returned to tidal action shall be borne by the applicant." While the permit may be issued by the commission with the approval of this proposal, a management plan approved by the commission, for the site is required prior to restoration to full tidal action.

Site Location and Description:

The marsh/riparian habitat mitigation site is located at the foot of Park Street adjacent to Freshwater Slough east of Eureka (see Figure II-1). The site is generally surrounded by farmland, although a residential area is nearby on the southwest corner, and Park Street separates it from the pasture to the south. Several warehouses occupy the southeast corner of the site; a lot split will divide this area from the mitigation site. The site is for the most part surrounded by land zoned unclassified by the county. R-1 zoning adjoins Park Street to the south. The General Plan designation for the entire area is agriculture. The existing warehouses are operating without conditional use permits because their use was established prior to the zoning of the parcel. A conditional use permit would be required for a significant change in the use of the warehouse parcel.

The site to be acquired and managed in accordance with the compensation plan totals 19.5 acres. Habitat restoration will affect about seventeen acres, almost all of which would be subject to tidal action if the surrounding dike protection is breached. About two acres of higher ground on the southwest corner of the site will be developed as riparian habitat. The remainder of the site is low-lying. Possibly because of the previous use of the site as a log pond, vegetation is sparse over the majority of the site and its current habitat value is low to moderate. A possible exception is a two to three acre freshwater marsh area at the southwest corner of the site that is dependent upon run-off from the higher ground to the west. This freshwater marsh contains cattails, sedges, rushes, marsh pennywort, duckweed, alder, and blackberries. The permit agencies have requested that the freshwater marsh be protected from tidal action.

c) The mitigation site would undergo the following changes to restore seventeen acres to tidal action:

- 1) Dike breach of twenty feet in length (pt A, Exhibit A, pg. II-4).
- 2) Dike construction to prohibit inundation of adjacent lands and freshwater marsh (pt. B).
- 3) Tide gate at point C on Exhibit to allow drainage of freshwater pond (pt. D).

d) Revegetation:

- 1) Revegetation will be naturally. The applicant believes that there is plentiful seed source to allow natural succession to occur.
- 2) Riparian vegetation (grass, alder, willow, blackberry) will be planted on the high ground in the southwest corner of the site and dikes.

e) According to the Executive Officer of the district, verbal or written approvals from the California Department of Fish & Game and the U.S. Fish and Wildlife Service have been obtained.

f) Management Plan:**SEE ADDENDUM**

Prior to restoration of tidal action, the district, Department of Fish & Game, Coastal Commission, and U.S. Fish and Wildlife Service will prepare and execute a management plan for the site.

Items for review in preparation of that plan will include but not be limited to, (1) public access and fencing, (2) dike maintenance, (3) educational studies relating to success of restoration (4) liability and maintenance, and (5) periodic review of success of the restoration. The plan will be reviewed and acted upon by the commission.

MEMORANDUM TO STAFF SUMMARY NCR-76-C-369 (Woodley Island Marina) OFF-SITE
MITIGATION

At the public hearing held in Point Arena on April 12, 1979, the commission approved the Harbor District's proposed off-site mitigation. Item "f)" Management Plan was changed to read as follows:

"Prior to restoration of tidal action, the District and the Department of Fish and Game will prepare and execute a Management Plan for the site.

It is the recommendation of the executive director that items for review in preparation of that plan should include but not be limited to - (1) public access and fencing; (2) dike maintenance; (3) educational studies relating to success of restoration; (4) liability and maintenance, and (5) periodic review of success of restoration. The plan will be reviewed and acted upon by the commission."

ATTACHMENT 2

RCAA NRS DESCRIPTION FOR SPARTINA ERADICATION ON HARBOR DISTRICT PROPERTIES

Applicant: Humboldt Bay Harbor, Recreation and Conservation District

Applicant Contact: Larry Oetker, Executive Director

Project Lead: Susannah Manning (subcontractor with Redwood Community Action Agency)

Project Name: Humboldt Bay Harbor District Invasive Spartina Eradication Project

Project Location: Harbor District Tidal Marsh properties, Humboldt Bay (Woodley Island, Dead Mouse Marsh, North Spit, Elk River Spit, Fields Landing, King Salmon)

I. Introduction/Background

The Humboldt Bay Harbor, Recreation and Conservation District (Harbor District) is a leader in the Humboldt Bay Regional Invasive Spartina Eradication program. The Harbor District has been working alongside the Humboldt Bay National Wildlife Refuge, the City of Arcata, Redwood Community Action Agency, the State Coastal Conservancy, and other partners for the past five years to remove invasive Spartina from tidal marshes around Humboldt Bay. The Harbor District is also the owner of several parcels in Humboldt Bay that include tidal marsh infested with the invasive denseflowered cordgrass, *Spartina densiflora* (“Spartina”). Tidal marshes in Humboldt Bay are largely dominated by Spartina, a noxious weed that degrades estuarine habitat by excluding native salt marsh plants, altering the benthic macroinvertebrate community¹, reducing net primary productivity², and potentially transforming mudflats to salt marsh.

Spartina is thought to have arrived in Humboldt Bay around 1860 in the solid ballast of Chilean ships. Over time, it has come to dominate an estimated 90% of salt marshes in the three adjacent estuaries of Humboldt Bay, the Eel River Delta, and the Mad River Estuary. Where it is left uncontrolled, Spartina is still spreading in Humboldt Bay, particularly in high elevation marshes, where the most diverse marsh plant community is found. Eradication of invasive Spartina on the West Coast by 2018 is a priority of the West Coast Governor’s Alliance (WCGA), and the 2010 WCGA Action Plan for Spartina sets eradication of the Humboldt Bay regional population as a top priority. Harbor District parcels infested with Spartina are located on the North Spit, Woodley Island, King Salmon, Fields Landing, and at Dead Mouse Marsh on Freshwater Slough. The presence of invasive Spartina on these properties is degrading natural resources in the tidal marsh and threatening restored marshes nearby (e.g. Indian Island, Eureka Slough Unit) with reinfestation.

The project furthers the goals of the Harbor District’s 2007 Humboldt Bay Management Plan (HBMP). The HBMP expresses support for the goals of the proposed project in the following statement:

Salt marshes in the Bay have been reduced substantially in area with respect to their pre-settlement extent, and they continue to be lost. In addition, the extant salt marshes are degraded by the dominant presence of dense-flowered cordgrass. The benefits of shoreline-protecting salt marshes for stabilizing sediment and protecting shoreline structures from wave impacts combine with a conservation focus on maintaining or restoring salt marshes to make the restoration or enhancement of salt marshes an important concern for the District. (HBMP, p.129)

The project will further two of the HBMP’s objectives:

Objective CAS-3: “Maintain and enhance habitat for sensitive species” (HBMP, p.204). The project will lead to the protection and restoration of habitat for Point Reyes bird’s beak and

¹ Mitchell, M.L. 2012. A Comparison of Terrestrial Invertebrate Communities in Spartina-Invaded And Restored Humboldt Bay Salt Marshes. Master’s thesis, Humboldt State University, Arcata, CA.

² Lagarde, L. 2012. Invasive Spartina densiflora Brongn. Reduces Primary Productivity in a Northern California Salt Marsh. Master’s thesis, Humboldt State University, Arcata, CA.

Humboldt Bay Owls Clover, both listed as endangered by the California Native Plant Society. Objective CAS-4: “Control or remove non-indigenous invasive species” (HBMP, 205).

II. Goals/Objectives:

The Project goal is to restore tidal marsh communities on Harbor District properties through the eradication of *Spartina* and the restoration of native marsh species. Woodley Island in particular has been identified as a potential seed bank of *Spartina* for the rest of the Bay, which increases the importance of beginning treatment as soon as possible. The North Spit site is also in close proximity to Indian Island, and *Spartina* removal in this location will reduce seed pressure on restored marshes in the North Bay. Dead Mouse Marsh was restored by the Harbor District in 1980 to mitigate for impacts from the construction of the Woodley Island marina. While the Harbor District has fulfilled its mitigation requirements, it wishes to protect and enhance the ecosystem functions of Dead Mouse Marsh as much as possible. The Elk River Spit site will remove a potential source of propagules for the Elk River Estuary Restoration project, planned for implementation by the City of Eureka in Summer 2019. The King Salmon and Fields Landing sites will remove a potential source of propagules for the White Slough Tidal Marsh Restoration site, currently being implemented by the USFWS.

Project implementation will reduce the amount of *Spartina* coverage and increase native marsh vegetation coverage on these Harbor District properties to the point where *Spartina* is easily managed by District Staff and the District’s partners through routine property management activities. This will reduce the potential for these properties to act as a seedbank for the rest of Humboldt Bay, and increases the resiliency of the Harbor District property wetlands in the face of climate change and other environmental stressors.

These goals will be met with specific, measurable objectives. *Spartina* coverage throughout Humboldt Bay, including Harbor District properties, was mapped in 2010-2011. This mapping effort indicated that ~77 acres of infested marsh were present on the Harbor District’s properties. Table 1 shows infested acreage by location, parcel, and density of *Spartina* cover at the time of the survey. Infested marshes on Harbor District property include 22 acres of low density *Spartina* (1-25% cover), 23 acres of moderate cover (26-60%), 31 acres of high density (61-100%), and 2 acres of unknown density.

The first objective will be to update and "ground-truth" the coverage mapping of the 77 acre treatment area. The second objective is the selection of preferred treatment options for each coverage density (discussed in detail in the Methodology section). The third objective is the initial eradication effort of *Spartina* over the entire project area, which, if successfully achieved, will result in the reduction of *Spartina* cover to less than 5% in the project area. The final objectives will be two annual follow up mapping and treatments, which, if successfully achieved, will result in dominance of the project area by native marsh plants. By the end of the three-year Project, any residual *Spartina* will be easily treated by Harbor District staff and its partners through routine property management activities. Table 2 below shows a timeline of each objective.

Table 2. Harbor District *Spartina* Eradication Project Objectives and Timeline

Objective	Project Month
Treat 77 acres, removing all <i>Spartina</i> to below ground level	1-6
Complete first follow-up mapping	12
Complete first follow-up treatment	15
Complete second follow-up mapping	27
Complete second follow-up treatment	27-31

III. Methodology:

The project tasks and timeline are presented in the table below. Tasks are discussed in detail below the table.

Table 3. Harbor District Spartina Eradication Project Tasks and Timeline

Task	Project Month
1. Initial and Follow-up Treatments	1-31
2. Monitoring and Adaptive Management	1-31

Task 1. Initial and Follow-Up Treatments: Mechanical removal methods will likely be selected for use on Harbor District Properties. Initial treatment is likely to be conducted with a combination of handheld brushcutters and/or rototillers in low- to moderate density infestations, and an aquatic tracked vehicle (Marshmaster) with a mower and a rototiller attachment in high density infestations that are accessible to the Marshmaster. These mechanical treatments involve mowing aboveground material, then disturbing the shallow subsurface (top 2-5 inches of marsh) with handheld brushcutters and mini-tillers, or rototilling using the Marshmaster (See photos). Large wrack generation is avoided by chopping aboveground plant material into a fine mulch. The metal blades of the brushcutter or rototiller grind the shallow rhizomes and reduce the seed bank. In a few locations, such as locations where Spartina is growing in riprap, manual removal (excavation with handheld tools such as shovels, pulaskis, and digging bars) may be used, or spot applications of imazapyr herbicide could be used, although this would require an additional permit application to the State Water Resources Control Board and would not occur in the absence of an Aquatic Pesticide Application Permit. Typically, one to two follow up resprout treatments are needed to fully kill all established plants. Resprout treatments involve much less disturbance than initial treatments and are conducted with a handheld brushcutter. Seedling treatments are also required, because the bare areas created by Spartina removal are readily colonized by Spartina seedlings. New seedlings are treated by flaming when young, or removed using brushcutters. Planting of native species has not been necessary in other treated areas around Humboldt Bay, as native marsh species recolonize treated areas independently. While follow-up treatments to remove seedlings will remain necessary until Spartina has been eradicated from the region, seedling numbers decline significantly within three years as the native marsh species establish a continuous cover.

Labor crews to implement removal activities will come from a number of sources. Eradication activities to date have been carried out by employees of the Redwood Community Action Agency, Harbor District, HBNWR, California Conservation Corps, Sheriff's Work Alternatives Program, and California Department of Forestry and Fire Protection.

Task 2. Monitoring: Monitoring will be conducted to evaluate progress towards the project goal of restoring tidal marsh communities through Spartina eradication and the restoration of native marsh species and to avoid any significant turbidity impacts from the project. Monitoring is summarized in the table below. Monitoring will rely primarily on rapid assessment methods performed by qualified biologists. This will allow a greater contribution of available funds to be directed towards implementation of treatment measures rather than extensive quantitative plot-based sampling, which is more labor intensive. Extensive quantitative data has been collected in association with research and method development by HBNWR.

Table 4. Harbor District Spartina Eradication Project Monitoring Timeline

Timeline	Monitoring Activity
Prior to treatment	Document baseline conditions: Spartina cover class, vegetation composition and relative cover; establish photopoints
Pre- and post-treatment turbidity monitoring	Photopoints will be established in treatment areas and adjacent reference sites to document turbidity in tidal channels and adjacent Bay or Slough waters. Photos will be taken immediately before and after treatment on each treatment day. If visual monitoring indicates a potentially significant turbidity impact from Spartina treatment, treatment in this area will be temporarily suspended until it can be demonstrated that increased turbidity is not significant or not a result of Spartina treatment, or until additional measures are put in place to reduce turbidity impacts.
Soon after primary treatment	Describe early post-treatment conditions
6 months after treatment	Inspect site to determine the need for follow-up treatment (will vary depending on the method(s) selected for primary treatment)
1 st spring after treatment	Monitor for <i>S. densiflora</i> seedlings and assess the need for treatment
Annually for 5 years	Inspect site to determine the need for follow-up treatments. Document Spartina cover class, vegetation composition and relative cover to assess recovery by native salt marsh vegetation; photograph site at established points
5 year evaluation	Evaluate site to determine whether performance criteria have been met
Long-term monitoring	Surveys at sufficient intervals (to be determined) to detect reinfestation early and allow rapid response

Baseline and effectiveness monitoring: As part of the regional mapping effort, data were collected in 2010 in the project area on percent *Spartina* cover, average plant diameter and height, substrate, degree of freshwater influence, tidal inundation, and whether plants were directly colonizing mudflats. Data on cover class of native species and *Spartina* (1-25%, 26-60%, or 61-100%) will be collected in June before treatment, annually during treatment and for five years after project completion. In addition, photos taken at established photopoints will provide a qualitative measure of restoration success.

Reference site: Vegetation composition in the project area will be compared with conditions in the restored salt marsh in HBNWR's Ma-le'i Dunes Unit, where *Spartina* removal was completed in 2008 and native marsh species have completely recolonized the site. The reference site represents the desired future condition of the project area. The reference site is located in North Humboldt Bay on the Mad River Slough, in relatively close proximity to the project area. No other areas of native salt marsh of significant extent are found in Humboldt Bay.

Success Criteria and adaptive management:

1. Spartina cover (live plants) diminishes by at least 50% each year until cover <5%.

- If criterion is not met, follow up treatments may be conducted more frequently, or different methods (chemical or mechanical) may be employed.
2. Spartina cover is maintained at a level $<5\%$ until regional eradication is achieved. If criterion is not met, more frequent or intensive maintenance treatments will be applied.
 3. Cover by non-Spartina emergent vegetation $\geq 50\%$ by the end of the third year. If criterion is not met and site appears to have limited influx of native marsh species propagules, planting of natives will be undertaken. If site appears to be a localized depression with anoxic conditions, revegetation is expected to take longer.
 4. Vegetation is dominated by native marsh plant species by the end of the fifth year. If criterion is not met, planting of natives will be undertaken.

Long-term monitoring: The project area will be surveyed every other year after eradication has been completed for early detection and rapid response to reinfestation by Spartina.

Regional Database, reporting, and data sharing: The Harbor District will maintain a database with monitoring data for the regional eradication program, including this project. Annual reports will be produced, provided to the NCRWQCB, and made available on the Harbor District website. Annual reports will describe planned work to be conducted in the coming year and provide the results of monitoring from the previous year. In addition, treatment reports will be prepared for each treatment area within the Harbor District's properties within 30 days of the completion of treatment work. Treatment reports will describe area treated, methods used, and preliminary monitoring results.

IV. Outcomes/Results:

The project is expected to result in the restoration of native marsh plant and wildlife communities on up to 77 acres of Harbor District Properties that are currently infested with invasive Spartina. In addition, the project will strengthen the partnership between the Harbor District and other partners in the regional Spartina eradication effort, including the Conservancy, the Wiyot Tribe, the City of Arcata, the City of Eureka, HBNWR, and RCAA.

Table 1a. Spartina Area and Cover by Location on Harbor District Properties

Location	Assessor's Parcel Numbers	Spartina Area (Acres) by Density				Total	Marsh Shoreline (linear ft)
		<i>Low Density (1-25% cover)</i>	<i>Medium Density (26- 60% cover)</i>	<i>High Density (61-100% cover)</i>	<i>Unknown</i>		
Woodley Island	405-031-009, 405-031-007, 405-031-010	6.1	6.6	2.6	0.0	15.3	4,805
North Spit	401-011-014, 401-011-026, 401-021-004, 401-021-013, 401-021-022, 401-031-025, 401-031-026	2.8	6.9	12.8	0.6	23.0	6,608
Dead Mouse Marsh	014-301-002	0	1.3	8.7	0.4	10.4	100
Elk River Spit	302-181-038	0.7	4.5	4.6	0	9.1	1,775
Fields Landing	306-201-042, 307-111-003, 307-101-002	0.84	0	0	0.27	1.11	2,200
King Salmon	305-131-040	0.0	0.0	0.0	1	1	202
Total		10.5	19.3	28.7	2.2	60.7	15,690

Table 1b. Latitude and Longitude of Project Sites.

Location	Latitude	Longitude
Woodley Island	40.811748	-124.156346
North Spit	40.827019	-124.171023
Dead Mouse Marsh	40.766550	-124.122824
Elk River Spit	40.759560	-124.196651
Fields Landing	40.717885	-124.218111
King Salmon	40.738235	-124.215818