Technical Memorandum

April 1, 2021

To:	Jim Furtado	Ref. No.:	11225450
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CC:	Misha Schwarz, Sr. Environmental Scientist, Project Director		
Subject:	**Botanical Scoping and Habitat Assessment**		

1. Introduction

1.1 Summary

This Technical Memorandum reports the results of site reconnaissance, vegetation and habitat assessment, and botanical scoping at parcel APN 508-242-044 owned by JLF Construction at 1700 Washington Ave., McKinleyville, California (see map in Appendix A). An additional seasonally appropriate floristic survey is needed and will be conducted in summer 2021 for potentially occurring special status plants (See Appendix B). Studies conducted during the site visit on March 22, 2021 included an initial spring botanical survey and developing an initial plant list (Appendix C). Site habitat photos can be found in Appendix D. Rapid Assessment protocols were used to classify vegetation (Appendix E) and USACE protocols were used to investigate for potential wetlands (both one-parameter and three parameter) or other waters (Appendix F). No one or three-parameter wetlands occur onsite. Vegetation includes a 0.27-acre patch of disturbed coastal brambles dominated by California blackberry (*Rubus ursinus*), which are considered a Sensitive Natural Community (S3 G4), as well as stand of trees dominated by planted Monterey pine (*Pinus radiata*), a patch of invasive Scotch broom (*Cytisus scoparius*), and a mowed field dominated by non-native sweet vernal grass (*Anthoxanthum odoratum*). Recommendations for the site include removal of invasive plants (see Recommendations in Section 5), seasonal restrictions on vegetation removal or surveys for potential nesting birds (see mitigation measure in Appendix I), and including native trees and shrubs in landscaping onsite as feasible.

1.2 Project Description

JLF Construction, Inc. is seeking permits to develop a vacant 6.8-acre lot zoned for single family residential in the suburban unincorporated community of McKinleyville, California.

1.3 Location

The Project Site is located within Assessor Parcel Number (APN) 508-242-044 owned by JLF Construction at 1700 Washington Ave., McKinleyville, in Humboldt County, California. The site is located on the Arcata

North USGS 7.5' quadrangle. The parcel is surrounded by single family residential development to the north, east and west, and an undeveloped parcel to the south along School Road. Aerial imagery available on Google Earth shows that the majority of the parcel has been cleared and graded dating back to the earliest imagery from 1989, with some areas of brush and small conifers along the southern and western margins. Earlier historical imagery available from Humboldt County shows that the site consisted of an open field with no visible trees or shrubs dating back to the earliest imagery inspected from 1954, and planting along the western edge of the parcel appears to have occurred in the interval between 1982 and 1989 imagery.

2. Regulatory Setting

2.1 Federally Listed Species

Special status plant species under Federal jurisdiction include those listed as endangered, threatened, or as candidate species by the Fish and Wildlife Service (USFWS) under the U.S. Endangered Species Act (ESA).

2.2 State Listed Species

Special status plant species under California Department of Fish and Wildlife (CDFW) jurisdiction include the following:

- Endangered, Threatened, or Candidate plant species listed under the California Endangered Species Act (CESA),
- plants listed as Rare under California Native Plant Protection Act (Fish & G. Code, § 1900 et seq.),
- and California Rare Plant Ranking (CRPR) rare plants on the California Native Plant Society's (CNPS) Lists 1 and 2.

Plant species on CNPS Lists 1 and 2 are considered eligible for state listing as Endangered or Threatened pursuant to the California Fish and Game Code, and CDFW has oversite of these special status plant species as a trustee agency. Such species are considered during the CEQA process because they meet the definition of Threatened or Endangered under Sections 2062 and 2067 of the California Fish and Game Code. Plants on CNPS Lists 3 and 4 do not have formal protection under CEQA, but may merit consideration in certain circumstances. Additionally, locally significant plants (CEQA Guidelines, § 15125, subd. (c)), or as designated in local or regional plans, policies, or ordinances) are considered special status plant species (CDFW 2018).

2.3 Sensitive Natural Communities

Natural vegetation communities listed as Sensitive in the California Natural Diversity Database (CNDDB) and on the California Sensitive Natural Communities List are to be addressed within the CEQA review process (CDFW 2021a). Sensitive Natural Communities (SNCs) are classified at the Alliance level according to A Manual of California Vegetation (Sawyer et al. 2009). Legacy SNCs are listed in CNDDB according to the Holland classification system (1986), and Holland types may be used when a current Alliance-level

classification does not exist (CDFW 2021a). CDFW considers alliances with a NatureServe State Rank of S1 to S3 to be Sensitive Natural Communities, and therefore these alliances are considered during the CEQA process (CDFW 2021a).

3. Methods

3.1 Pre-Survey Investigations

Prior to the site visit, a scoping list of CRPR plant species and habitats with recorded occurrences in the project vicinity was compiled on March 18, 2021 by consulting the *California Natural Diversity Database* (CNDDB) [CDFW 2021b], the CNPS *Inventory of Rare and Endangered Vascular Plants* (CNPS 2021), and U.S. Fish and Wildlife Service IPaC (USFWS 2021). The CNDDB RareFind database was also consulted for rare plant occurrences documented in the project vicinity.

The scoping list includes special-status plants with documented occurrences on the Arcata North USGS quadrangle or adjacent quadrangles (nine-quad area). The query yielded 46 special status plant species with CRPR rank of 1 or 2, including three state and federally endangered plants. All species were reviewed prior to the field survey and evaluated for their potential to occur at the site. Of the species identified during scoping, three have a moderate probability of occurring within the study area, 28 have a low probability of occurring within the study area, and 15 have no potential to occur onsite because they are restricted to coastal dunes, bluffs, or saltmarshes. Plants with a moderate potential to occur onsite include Howell's montia (*Montia howellii,* CRPR 2B.2), Siskiyou checkerbloom (*Sidalcea malviflora* ssp. *patula*, CRPR 1B.2) and the similar coast checkerbloom (*Sidalcea oregana* ssp. *eximia,* CRPR 1B.2), which have been documented in similar disturbed fields and roadside edge habitats in suburban areas nearby. CNDDB documented four Sensitive Habitats (classified according to Holland, 1986) within the 9-quad area: Northern Coastal Salt Marsh, Northern Foredune Grassland, Sitka Spruce Forest, Sphagnum Bog. The potential for sensitive habitats to occur onsite was evaluated during site reconnaissance and vegetation assessment on March 22, 2021 (see Section 3.4).

3.2 Floristic Surveys

GHD botanist Kelsey McDonald conducted the first of two surveys needed during seasonally appropriate blooming periods for potentially occurring special status plants onsite. The early spring survey was conducted concurrently with vegetation mapping and wetland reconnaissance on March 22, 2021. An additional mid-to-late season survey is recommended and will take place during the blooming period for Siskiyou checkerbloom (*Sidalcea malviflora* ssp. *patula*) and coast checkerbloom (*Sidalcea oregana* ssp. *eximia*) (typically June-August), which have been documented in similar suburban edge habitats in the area, as well as other late-blooming potentially occurring plants.

The special status plant survey followed *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* by the California Natural Resource Agency (CDFW 2018) and *General Rare Plant Survey Guidelines by the Endangered Species Recovery Program* (USFWS 2002). The special status plant survey was conducted by walking the site and identifying all plant species

encountered to the lowest taxonomic level necessary for rare plant identification. Nomenclature follows *The Jepson Manual* (Baldwin et al 2012). GHD Botanist Kelsey McDonald has a M.S. in Environmental and Natural Resource Sciences from Humboldt State University, and she is a CNPS Certified Consulting Botanist with over six years of experience conducting special-status plant surveys. Kelsey McDonald conducted the survey on March 22, 2021 from 0900-1300 hours. The weather was overcast with occasional misting and approximately 50 degrees Fahrenheit, with low to no wind (0-1 on Beaufort scale). A list of species observed within the project area is provided (Appendix C).

3.3 Wetland Investigation

The site was investigated for any potential wetlands and other waters of the U.S./state by walking the site in search of hydrophytic vegetation or other potential wetland indicators. Soil pits were dug in low areas most likely to collect water onsite to determine if hydric soil or hydrology indicators occur. Vegetation, soil, and hydrology were characterized using USACE Western Mountains, Valleys and Coast Wetland Determination Data Forms (Appendix E).

3.4 Vegetation Mapping and Assessment

Vegetation communities onsite with species typical of Sensitive Natural Communities were documented in the field and classified at the alliance level according to the Manual of California Vegetation (Sawyer et al. 2009) using the Rapid Assessment method. Kelsey McDonald conducted Vegetation Assessments according to protocol (CDFW 2018, CDFW-CNPS 2019) on March 22, 2021. Vegetation Assessment forms (Appendix E) are used to characterize dominant vegetation and evaluate habitat quality, and these assessments provided the basis for designating vegetation as Sensitive Natural Communities. Photodocumentation of habitats observed onsite can be found in Appendix C, and a soil map can be found in Appendix G. Vegetation communities were mapped using points collected in the field with an Eos Arrow 100 Submeter Global Positioning System (GPS) Receiver with Global Navigation Satellite System (GNSS) and an iPad running ArcGIS Collector software in the WGS84 datum. Vegetation community boundaries were then digitized with GIS from aerial imagery based on field observations and visible vegetation signatures.

4. Results

4.1 Special Status Plants

No special status plant species were observed during the early season floristic survey of the project area on March 22, 2021. The March 22 survey was timed to observe early-spring blooming potentially occurring special status species, particularly Howell's montia (*Montia howellii*), which has been documented in similarly disturbed, graded habitats. An additional mid-late season survey is needed and will be conducted to complete seasonally appropriate surveys for special status plants, and an additional memo will be prepared summarizing results at that time.

4.2 Wetland Investigation

No areas of strongly hydrophytic vegetation were observed while walking the site and recording species and dominant vegetation. Three areas (see map in Appendix A) were selected for further investigation based on their low geomorphic position, a secondary hydrology indicator. Soil pits dug to ~16 inches at the three points contained rich dark sandy loam (matrix color 10YR 2/2) with no redoximorphic features (see data forms in Appendix F) and are not hydric (wetlands) soils. NRCS Web Soil Survey similarly reported that the area contains soils in the Arcata-Candymountain Complex, which are well-drained fine sandy loams found on marine terraces (Appendix G). No groundwater was encountered in the soil pits. The Eureka Woodley Island weather station recorded 58% of the annual average precipitation had fallen over the 2020-2021 wet season, starting October 2020 (see WETS table in Appendix H). Soils were dry and crumbling despite recent rains, and no additional hydrology indicators were observed. All three plots failed the dominance test for hydrophytic vegetation with at least 50% facultative-upland (FACU) and upland (UPL) plants, contained upland soils, and did not have wetland hydrology. The site consists of 3-parameter uplands based on field investigations that showed a lack of one and three parameter wetlands, and no wetlands have been previously mapped on the parcel (see NWI Map in Appendix I).

4.3 Vegetation and Sensitive Natural Community Assessment

The parcel primarily consists of a graded and mowed open field with constructed terraces stepping down from south to north, a mixture of non-native and native trees along both the eastern and western margins of the parcel, areas of native California blackberry (*Rubus ursinus*) brambles on the northwestern margin of the parcel, and a patch of invasive Scotch broom (*Cytisus scoparius*) in an area of ground disturbance near the center of the site. Aerial imagery available on Google Earth and the county shows that the site has been graded for many years dating back to at least the 1950s, with the imagery from 1989 showing an open field with young trees or shrubs planted in a line on the western property boundary. Color imagery from 2003 shows the growth of trees planted on the western margin and a few scattered trees to the south and east. Subsequent imagery shows varying levels of brush, mowing, and other disturbance onsite as well as the growth of the canopy on the eastern margin of the property near Washington Avenue. Vegetation communities with species associated with Sensitive Natural Communities were characterized using the Rapid Assessment method (Appendix E), and other non-native vegetation types were mapped based on field observations as discussed below (Appendix A). Many escaped exotic species and several species designated as invasive by the California Invasive Plant Council (Cal-IPC) were noted onsite, as discussed further below.

4.3.1 Monterey Pine (*Pinus radiata*) Semi-Natural Alliance (Proposed)

Monterey pine (*Pinus radiata*) was most prevalent in the mixed canopy onsite (noted as ~50% cover in Rapid Assessment), with native shore pine (*Pinus contorta* ssp. *contorta*) (~15% cover) and Sitka spruce (*Picea sitchensis*) (~8% cover), blue gum (*Eucalyptus globulus*) (Cal-IPC Limited) and scattered Douglas fir (*Pseudotsuga menziesii*), red alder (*Alnus rubra*), and non-native short leaf box (*Pittosporum tenuifolium*). California blackberry primarily dominated the understory. Although Monterey pine is rare (CRPR 1B.1) (CNPS 2021) within its native range in the Central Coast of California, it has been widely planted and naturalized on the North Coast (Baldwin et al. 2012). Based on plant species composition and Manual of

California Vegetation membership rules ("*Pinus radiata* > 25% cover in the tree layer (Sawyer and Keeler-Wolf 1995)"), this community would be a good fit for Pinus muricata - Pinus radiata Forest & Woodland Alliance (G3 S3.2). However, planted stands of Monterey pine are not considered to be part of this Sensitive Natural Community. The Manual of California Vegetation Online specifically states, "Planted *Pinus radiata* stands occur in Sonoma Co. (Klein et al. 2015) and elsewhere, but they are not considered here as part of the range of the native alliance." This community has been proposed as Monterey Pine Semi-Natural Alliance based on the dominance of planted Monterey pine, which is not native to the region. Invasive English ivy (Cal-IPC High) occurred in this area.

4.3.2 Coastal Brambles (*Rubus ursinus*) Alliance

The northwestern margin of the property was formerly a continuation of the planted Monterey pine community; however, non-native Monterey pine appears to have been cut and left onsite sometime after 2016 based on aerial imagery and the presence of cut stumps and felled trees with the distinctive closed Monterey pinecones. At the time of the survey on March 22, 2021, the felled trees were overgrown by a strong dominance of native California blackberry (90% cover). Based on current conditions and strong dominance of California blackberry, this area keys to the California blackberry *Rubus* Shubland Alliance/Coastal Brambles Sensitive Natural Community (S3G4) (Sawyer et al. 2009). This vegetation alliance has a State Rank of S3, and therefore it is categorized as a Sensitive Natural Community (CDFW 2021a). Although the coastal brambles area is now dominated by native California blackberry, the area is also regularly disturbed by the adjacent residential development and contains many escaped garden exotics, some trash and garden debris, and invasive scotch broom. California blackberry is a hardy, fast-growing species that is locally common both in the understory of North Coast coniferous forest and small bramble patches on the North Coast. The recently established 0.28-acre coastal bramble patch is not locally significant as a plant community; however, the overhead thicket and hollows in the dead felled Monterey pines could provide likely nesting habitat and valuable foraging habitat for many songbirds.

4.3.3 Sweet Vernal Grass (*Anthoxanthum odoratum*) Semi-Natural Alliance

The graded and mowed field was primarily dominated by non-native sweet vernal grass (*Anthoxanthum odoratum*) with purple velvet grass (*Holcus lanatus*), California brome (*Bromus sitchensis* var. *carinatus*), self-heal (*Prunella vulgaris*), hairy cat's ear (*Hypochaeris radicata*), English plantain (*Plantago lanceolata*), and hybrid wild radish (*Raphanus raphinastrum* x *sativus*). This vegetation community is best reflected by the *Holcus lanatus - Anthoxanthum odoratum* Herbaceous Semi-Natural Alliance in the Manual of California Vegetation (Sawyer et al. 2009). Sweet vernal grass and purple velvet grass are considered invasive by the California Invasive Plant Council (Cal-IPC); however, removal of these widespread grasses is not likely to be feasible.

4.3.4 Scotch broom (*Cytisus scoparius*) Shrubland Semi-Natural Alliance

Invasive Scotch broom has established dominance in a patch of disturbed soil near the center of the parcel along with invasive cotoneaster (*Cotoneaster franchettii*) (Cal-IPC Moderate), California blackberry, and coyotebrush (*Baccharis pilularis*). Scotch broom also occurs in all other habitats on the property, and it is rated as highly invasive by Cal-IPC. Scotch broom has been controlled by mowing on most of the property,

but mature individuals can also be found on the edges of the tree canopy and the coastal brambles. Other problematic invasive species in this area include pampas grass (*Cortaderia jubata*) (Cal-IPC High) and English holly (*Ilex aquifolium*) (Cal-IPC Limited).

Table 1. Acreage of Vegetation Types within the Project Area

Vegetation Type	Area (acres)
Coastal Brambles	0.28
Monterey Pine	1.11
Sweet Vernal Grass	5.33
Scotch Broom	0.11

5. Conclusion and Recommendations

The purpose of this assessment was to evaluate the potential for special status plants to occur onsite and to investigate the parcel for sensitive habitats and potential wetlands onsite. The parcel contains a mixture of native and non-native dominated vegetation communities, including non-native Monterey pine woodland, native coastal brambles, invasive Scotch broom, and mowed grassland dominated by non-native sweet vernal grass. Highly invasive Scotch broom, English ivy, Himalayan blackberry, and pampas grass should be high priority for removal. Invasive English holly, cotoneaster, periwinkle (*Vinca major*), and bull thistle (*Cirsium vulgare*), as well as an uncommon non-native star acacia (*Acacia verticillata*) are also recommended for removal. The coastal brambles vegetation community is classified as *S3-Vulnerable* in the state of California, and therefore considered a Sensitive Natural Community. However, the bramble patch is less than an acre, and was recently established in the disturbed parcel by cutting the non-native planted trees and excluding the area from mowing. The coastal bramble patch has low significance as a plant community, but it does provide native habitat value, and mitigation is recommended for impacts to the community. The coastal bramble patch appears to have high habitat value for songbirds protected in California under the Migratory Bird Treaty Act (MBTA). If removal of the coastal bramble patch or any trees is planned onsite, it should occur outside of the breeding season (March 15-August 15), or surveys will be needed to ensure any nesting birds in the area are protected. The recommended mitigation measure for potential impacts to nesting birds protected under MBTA has been provided in Appendix I. It is also recommended that the landowner incorporates native trees and shrubs by landscaping or preservation of native trees and shrubs currently on the parcel. Recommended native landscaping species that could replace the native habitat value of the recently established coastal brambles on the parcel include California blackberry, coast silk tassel (*Garrya elliptica*), red flowering currant (*Ribes sanguineum*), evergreen huckleberry (*Vaccinium ovatum*), or coast twinberry (*Lonicera involucrata*), among other locally occurring plants that may be available at a restoration nursery.

6. References

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USFWS, 2021. Information for Planning and Consultation (IPaC). Accessed March 18, 2021. https://ecos.fws.gov/ipac/

Appendices

A. Map Figure

B. Scoping Table

C. Plant Species Observed

D. Photo Index

E. Rapid Assessment Data Sheets

E. Wetland Determination Data Forms

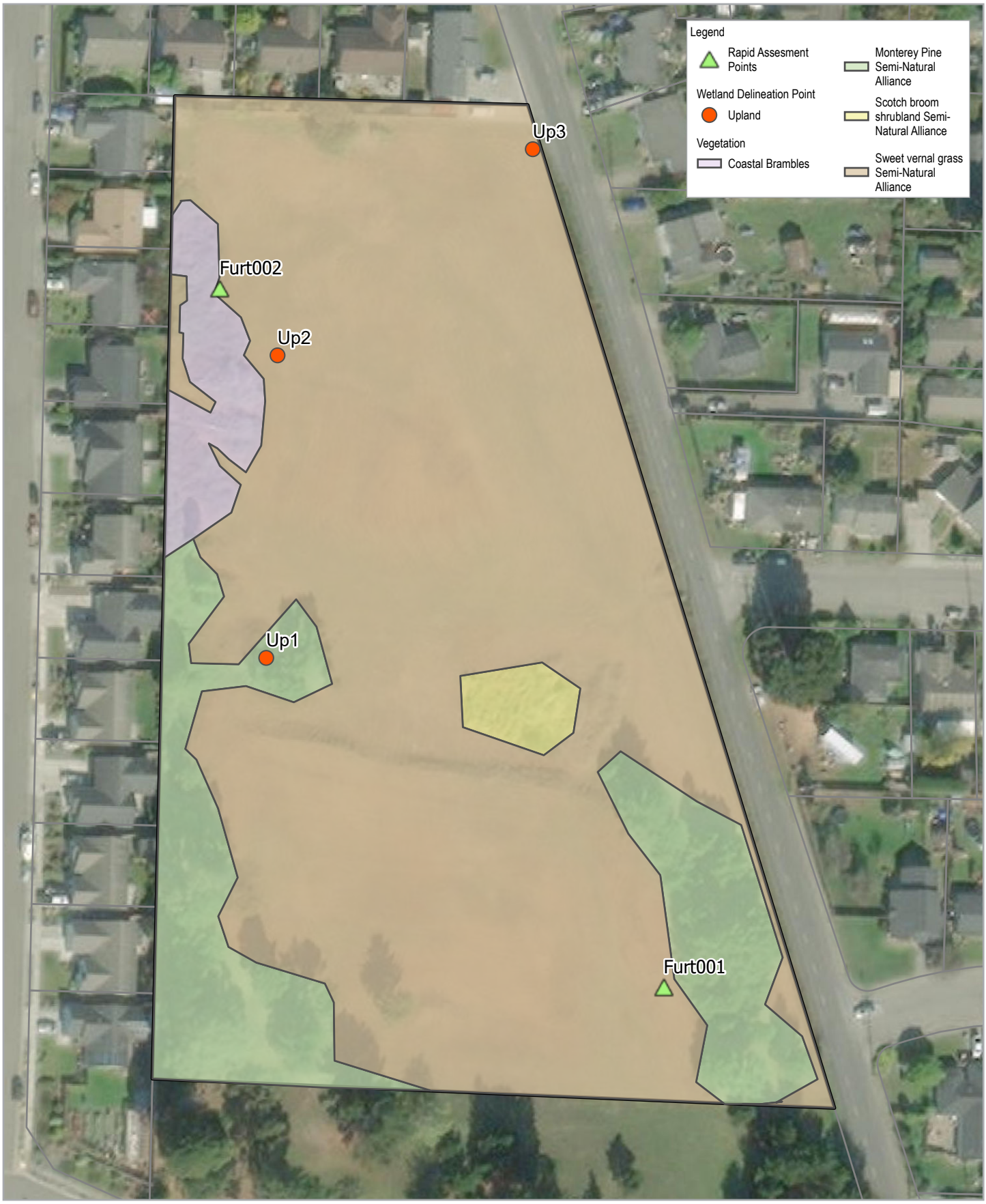
F. NRCS Soil Survey Report

G. WETS Table

H. National Wetland Inventory Mapper

I. Recommended Mitigation Measure for Potential Impacts to Nesting Birds

Appendix A. Map Figures



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Map Projection: Lambert Conformal Conic
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Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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GHD

JLF CONSTRUCTION
FURTADO PROPERTY
BOTANICAL ASSESSMENT

Project No. **11225450**
Revision No. **-**
Date **March 2021**

Habitat Assessment

FIGURE 1

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Data source: World_Imagery: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community. Created by: jlopez4

Appendix B. Scoping Table of Potentially Occurring Special Status Plant Species

Scientific Name	Common Name	Family	CRPR	GRank	SRank	CESA	FESA	Blooming	Habitat	Potential
Abronia umbellata var. *breviflora*	pink sand-verbena	Nyctaginaceae	1B.1	G4G5T2	S2	None	None	Jun-Oct	Coastal dunes	No Potential. Coastal dune habitat not present.
Astragalus pycnostachyus var. *pycnostachyus*	coastal marsh milk-vetch	Fabaceae	1B.2	G2T2	S2	None	None	(Apr)Jun-Oct	Coastal dunes (mesic), Coastal scrub, Marshes and swamps (coastal salt, streamsides)	No Potential. Coastal dune and marsh habitat not present.
Astragalus umbraticus	Bald Mountain milk-vetch	Fabaceae	2B.3	G4	S2	None	None	May-Aug	Cismontane woodland, Lower montane coniferous forest; sometimes roadside	Low Potential. Disturbed suburban field unlikely to provide suitable habitat.
Bryoria spiralifera	twisted horsehair lichen	Parmeliaceae	1B.1	G3	S1S2	None	None		North Coast coniferous forest (immediate coast); Usually on conifers	Low Potential. Remaining conifers in suburban area unlikely to provide suitable habitat.
Cardamine angulata	seaside bittercress	Brassicaceae	2B.2	G4G5	S3	None	None	(Jan)Mar-Jul	Lower montane coniferous forest, North Coast coniferous forest; Wet areas, streambanks	Low Potential. Suitable wetland habitat not likely to occur.
Carex arcta	northern clustered sedge	Cyperaceae	2B.2	G5	S1	None	None	Jun-Sep	Bogs and fens, North Coast coniferous forest (mesic)	Low Potential. Suitable wetland habitat not likely to occur.
Carex lenticularis var. *limnophila*	lagoon sedge	Cyperaceae	2B.2	G5T5	S1	None	None	Jun-Aug	Bogs and fens, Marshes and swamps, North Coast coniferous forest; shores, beaches; often gravelly	Low Potential. Suitable wetland habitat not likely to occur.
Carex leptalea	bristle-stalked sedge	Cyperaceae	2B.2	G5	S1	None	None	Mar-Jul	Bogs and fens, Meadows and seeps (mesic), Marshes and swamps	Low Potential. Suitable wetland habitat not likely to occur.
Carex lyngbyei	Lyngbye's sedge	Cyperaceae	2B.2	G5	S3	None	None	Apr-Aug	Marshes and swamps (brackish or freshwater)	No Potential. This species occurs in

Scientific Name	Common Name	Family	CRPR	GRank	SRank	CESA	FESA	Blooming	Habitat	Potential
										brackish marshes on the immediate coast.
Carex praticola	northern meadow sedge	Cyperaceae	2B.2	G5	S2	None	None	May-Jul	Meadows and seeps (mesic)	Low Potential. Suitable wetland habitat not likely to occur.
Carex viridula ssp. *viridula*	green yellow sedge	Cyperaceae	2B.3	G5T5	S2	None	None	(Jun)Jul-Sep(Nov)	Bogs and fens, Marshes and swamps (freshwater), North Coast coniferous forest (mesic)	Low Potential. Suitable wetland habitat not likely to occur.
Castilleja ambigua var. *humboldtiensis*	Humboldt Bay owl's-clover	Orobanchaceae	1B.2	G4T2	S2	None	None	Apr-Aug	Marshes and swamps (coastal salt)	No Potential. This species occurs in saltmarshes on the immediate coast.
Castilleja litoralis	Oregon coast paintbrush	Orobanchaceae	2B.2	G3	S3	None	None	Jun-Jul	Coastal bluff scrub, Coastal dunes, Coastal scrub; sandy	No Potential. Coastal dune and bluff habitat not present.
Castilleja mendocinensis	Mendocino Coast paintbrush	Orobanchaceae	1B.2	G2	S2	None	None	Apr-Aug	Coastal bluff scrub, Closed-cone coniferous forest, Coastal dunes, Coastal prairie, Coastal scrub	No Potential. Coastal dune and bluff habitat not present.
Chloropyron maritimum ssp. *palustre*	Point Reyes bird's-beak	Orobanchaceae	1B.2	G4?T2	S2	None	None	Jun-Oct	Marshes and swamps (coastal salt)	No Potential. This species is restricted to saltmarshes on the immediate coast.
Collinsia corymbosa	round-headed Chinese-houses	Plantaginaceae	1B.2	G1	S1	None	None	Apr-Jun	Coastal dunes	No Potential. Coastal dune habitat not present.
Discelium nudum	naked flag moss	Disceliaceae	2B.2	G4G5	S1	None	None		Coastal bluff scrub (soil, on clay banks)	No Potential. Coastal bluff habitat not present.
Empetrum nigrum	black crowberry	Empetraceae	2B.2	G5	S1?	None	None	Apr-Jun	Coastal bluff scrub, Coastal prairie	Low Potential. Coastal bluff habitat not present, disturbed field unlikely to provide suitable habitat.

Scientific Name	Common Name	Family	CRPR	GRank	SRank	CESA	FESA	Blooming	Habitat	Potential
Erigeron bloomeri var. *nudatus*	Waldo daisy	Asteraceae	2B.3	G5T4	S3	None	None	Jun-Jul	Lower montane coniferous forest, Upper montane coniferous forest; serpentinite	Low Potential. Serpentine substrates unlikely to occur onsite, disturbed field unlikely to provide suitable habitat.
Erysimum menziesii	Menzies' wallflower	Brassicaceae	1B.1	G1	S1	CE	FE	Mar-Sep	Coastal dunes	No Potential. Coastal dune habitat not present.
Erythronium oregonum	giant fawn lily	Liliaceae	2B.2	G4G5	S2	None	None	Mar-Jun(Jul)	Cismontane woodland, Meadows and seeps; sometimes serpentinite, rocky, openings	Low Potential. Disturbed field unlikely to provide suitable habitat.
Erythronium revolutum	coast fawn lily	Liliaceae	2B.2	G4G5	S3	None	None	Mar-Jul(Aug)	Bogs and fens, Broadleafed upland forest, North Coast coniferous forest; Mesic, streambanks	Low Potential. Disturbed field unlikely to provide suitable habitat.
Fissidens pauperculus	minute pocket moss	Fissidentaceae	1B.2	G3?	S2	None	None		North Coast coniferous forest (damp coastal soil)	Low Potential. Disturbed field unlikely to provide suitable habitat.
Gilia capitata ssp. *pacifica*	Pacific gilia	Polemoniaceae	1B.2	G5T3	S2	None	None	Apr-Aug	Coastal bluff scrub, Chaparral (openings), Coastal prairie, Valley and foothill grassland	Low Potential. Disturbed field unlikely to provide suitable habitat.
Gilia millefoliata	dark-eyed gilia	Polemoniaceae	1B.2	G2	S2	None	None	Apr-Jul	Coastal dunes	No Potential. Coastal dune habitat not present.
Hesperevax sparsiflora var. *brevifolia*	short-leaved evax	Asteraceae	1B.2	G4T3	S2	None	None	Mar-Jun	Coastal bluff scrub (sandy), Coastal dunes, Coastal prairie	Low Potential. Coastal dune and bluff habitat not present, disturbed field unlikely to provide suitable habitat.
Juncus nevadensis var. *inventus*	Sierra rush	Juncaceae	2B.2	G5T3T4	S1	None	None	Jul-Nov	Bogs and fens	Low Potential. Suitable wetland habitat not likely to occur.

Scientific Name	Common Name	Family	CRPR	GRank	SRank	CESA	FESA	Blooming	Habitat	Potential
Lasthenia californica ssp. *macrantha*	perennial goldfields	Asteraceae	1B.2	G3T2	S2	None	None	Jan-Nov	Coastal bluff scrub, Coastal dunes, Coastal scrub	Low Potential. Disturbed field unlikely to provide suitable habitat.
Lathyrus japonicus	seaside pea	Fabaceae	2B.1	G5	S2	None	None	May-Aug	Coastal dunes	No Potential. Coastal dune habitat not present.
Lathyrus palustris	marsh pea	Fabaceae	2B.2	G5	S2	None	None	Mar-Aug	Bogs and fens, Coastal prairie, Coastal scrub, Lower montane coniferous forest, Marshes and swamps, North Coast coniferous forest; mesic	Low Potential. Suitable mesic/wetland habitat not likely to occur.
Layia carnosa	beach layia	Asteraceae	1B.1	G2	S2	CE	FE	Mar-Jul	Coastal dunes, Coastal scrub (sandy)	No Potential. Coastal dune habitat not present.
Lilium occidentale	western lily	Liliaceae	1B.1	G1	S1	CE	FE	Jun-Jul	Bogs and fens, Coastal bluff scrub, Coastal prairie, Coastal scrub, Marshes and swamps (freshwater), North Coast coniferous forest (openings)	Low Potential. Suitable wetland scrub and prairie habitat not likely to occur.
Lycopodiella inundata	inundated bog club-moss	Lycopodiaceae	2B.2	G5	S1?	None	None	Jun-Sep	Bogs and fens (coastal), Lower montane coniferous forest (mesic), Marshes and swamps (lake margins)	Low Potential. Suitable mesic/wetland habitat not likely to occur.
Monotropa uniflora	ghost-pipe	Ericaceae	2B.2	G5	S2	None	None	Jun-Aug(Sep)	Broadleafed upland forest, North Coast coniferous forest	Low Potential. Disturbed field unlikely to provide suitable habitat.
Montia howellii	Howell's montia	Montiaceae	2B.2	G3G4	S2	None	None	(Jan-Feb)Mar-May	Meadows and seeps, North Coast coniferous forest, Vernal pools;	Moderate Potential. Howell's montia can occur in disturbed and

Scientific Name	Common Name	Family	CRPR	GRank	SRank	CESA	FESA	Blooming	Habitat	Potential
									vernally mesic, sometimes roadsides	compacted areas similar to those onsite.
Oenothera wolfii	Wolf's evening-primrose	Onagraceae	1B.1	G2	S1	None	None	May-Oct	Coastal bluff scrub, Coastal dunes, Coastal prairie, Lower montane coniferous forest; sandy, usually mesic	Low Potential. Disturbed field unlikely to provide suitable habitat.
Packera bolanderi var. *bolanderi*	seacoast ragwort	Asteraceae	2B.2	G4T4	S2S3	None	None	(Jan-Apr)May-Jul(Aug)	Coastal scrub, North Coast coniferous forest; Sometimes roadsides	Low Potential. Disturbed field unlikely to provide suitable habitat.
Piperia candida	white-flowered rein orchid	Orchidaceae	1B.2	G3	S3	None	None	(Mar)May-Sep	Broadleafed upland forest, Lower montane coniferous forest, North Coast coniferous forest; sometimes serpentinite	Low Potential. Disturbed field unlikely to provide suitable habitat.
Polemonium carneum	Oregon polemonium	Polemoniaceae	2B.2	G3G4	S2	None	None	Apr-Sep	Coastal prairie, Coastal scrub, Lower montane coniferous forest	Low Potential. Disturbed field unlikely to provide suitable habitat.
Romanzoffia tracyi	Tracy's romanzoffia	Hydrophyllaceae	2B.3	G4	S2	None	None	Mar-May	Coastal bluff scrub, Coastal scrub; rocky	No Potential. Rocky coastal bluff and scrub habitat not present.
Sidalcea malviflora ssp. *patula*	Siskiyou checkerbloom	Malvaceae	1B.2	G5T2	S2	None	None	(Apr)May-Aug	Coastal bluff scrub, Coastal prairie, North Coast coniferous forest; often roadcuts	Moderate Potential. Siskiyou checkerbloom is known to occur in disturbed roadsides in the area.
Sidalcea oregana ssp. *eximia*	coast checkerbloom	Malvaceae	1B.2	G5T1	S1	None	None	Jun-Aug	Lower montane coniferous forest, Meadows and seeps, North Coast coniferous forest	Moderate Potential. Coast checkerbloom has been documented in similarly disturbed habitats in the area.
Silene scouleri ssp. *scouleri*	Scouler's catchfly	Caryophyllaceae	2B.2	G5T4T5	S2S3	None	None	(Mar-May)Jun-Aug(Sep)	Coastal bluff scrub, Coastal prairie, Valley and foothill grassland	Low Potential. Disturbed field unlikely

Scientific Name	Common Name	Family	CRPR	GRank	SRank	CESA	FESA	Blooming	Habitat	Potential
										to provide suitable habitat.
Spergularia canadensis var. *occidentalis*	western sand-spurrey	Caryophyllaceae	2B.1	G5T4	S1	None	None	Jun-Aug	Marshes and swamps (coastal salt)	No Potential. This species is restricted to saltmarshes on the immediate coast.
Trichodon cylindricus	cylindrical trichodon	Ditrichaceae	2B.2	G4	S2	None	None		Broadleafed upland forest, Meadows and seeps, Upper montane coniferous forest; sandy, exposed soil, roadbanks	Low Potential. Disturbed suburban field unlikely to provide suitable habitat.
Viola palustris	alpine marsh violet	Violaceae	2B.2	G5	S1S2	None	None	Mar-Aug	Bogs and fens (coastal), Coastal scrub (mesic)	Low Potential. Suitable wetland habitat not likely to occur.

Appendix C. Species Observations

Table 1. Plant Species Observed

Scientific Name	Common Name	Status	Family	Date	Indicator
Acacia verticillata	Star acacia	non-native	Fabaceae	3/22/2021	
Alnus rubra	Red alder	native	Betulaceae	3/22/2021	FAC
Anthoxanthum odoratum	Sweet vernal grass	invasive non-native	Poaceae	3/22/2021	FACU
Baccharis pilularis	Coyote brush	native	Asteraceae	3/22/2021	
Briza maxima	Rattlesnake grass	invasive non-native	Poaceae	3/22/2021	
Bromus diandrus	Ripgut brome	invasive non-native	Poaceae	3/22/2021	
Bromus sitchensis var. *carinatus*	California brome	native	Poaceae	3/22/2021	
Cardamine oligosperma	Idaho bittercress	native	Brassicaceae	3/22/2021	FAC
Cirsium vulgare	Bullthistle	invasive non-native	Asteraceae	3/22/2021	FACU
Cortaderia jubata	Andean pampas grass	invasive non-native	Poaceae	3/22/2021	FACU
Cotoneaster franchetii	Cotoneaster	invasive non-native	Rosaceae	3/22/2021	
Cytisus scoparius	Scotch broom	invasive non-native	Fabaceae	3/22/2021	
Daucus carota	Carrot	non-native	Apiaceae	3/22/2021	FACU
Eucalyptus globulus	Blue gum	invasive non-native	Myrtaceae	3/22/2021	
Euphorbia helioscopia	Wartweed	non-native	Euphorbiaceae	3/22/2021	
Fragaria chiloensis	Beach strawberry	native	Rosaceae	3/22/2021	FACU
Frangula purshiana	Cascara sagrada	native	Rhamnaceae	3/22/2021	FAC
Galium aparine	Cleavers	native	Rubiaceae	3/22/2021	FACU
Geranium dissectum	Wild geranium	invasive non-native	Geraniaceae	3/22/2021	
Geranium robertianum	Robert's geranium	non-native	Geraniaceae	3/22/2021	FACU
Hedera helix	English ivy	invasive non-native	Araliaceae	3/22/2021	FACU
Holcus lanatus	Common velvetgrass	invasive non-native	Poaceae	3/22/2021	FAC
Hypochaeris radicata	Hairy cat's ear	invasive non-native	Asteraceae	3/22/2021	FACU

Ilex aquifolium	Holly	invasive non-native	Aquifoliaceae	3/22/2021	FACU
Lamium purpureum	Purple dead nettle	non-native	Lamiaceae	3/22/2021	
Leucanthemum vulgare	Oxe-eye daisy	invasive non-native	Asteraceae	3/22/2021	FACU
Linum bienne	Flax	non-native	Linaceae	3/22/2021	
Lonicera involucrata	Coast twinberry	native	Caprifoliaceae	3/22/2021	FAC
Narcissus pseudonarcissus	Daffodil	non-native	Amaryllidaceae	3/22/2021	
Picea sitchensis	Sitka spruce	native	Pinaceae	3/22/2021	FAC
Pinus contorta ssp. *contorta*	Shore pine	native	Pinaceae	3/22/2021	FAC
Pinus radiata	Monterey pine	non-native	Pinaceae	3/22/2021	
Pittosporum tenuifolium	Short leaf box	non-native	Pittosporaceae	3/22/2021	
Plantago lanceolata	English plantain	invasive non-native	Plantaginaceae	3/22/2021	FACU
Polystichum munitum	Western sword fern	native	Dryopteridaceae	3/22/2021	FACU
Prunella vulgaris	Self-heal	native	Lamiaceae	3/22/2021	FACU
Prunus laurocerasus	Cherry laurel	non-native	Rosaceae	3/22/2021	
Pseudotsuga menziesii	Douglas fir	native	Pinaceae	3/22/2021	FACU
Raphanus raphanistrum x *sativus*	Wild radish hybrid	non-native	Brassicaceae	3/22/2021	
Rubus armeniacus	Himalayan blackberry	invasive non-native	Rosaceae	3/22/2021	FAC
Rubus ursinus	California blackberry	native	Rosaceae	3/22/2021	FACU
Rumex acetosella	Sheep sorrel	invasive non-native	Polygonaceae	3/22/2021	FACU
Scrophularia californica	California bee plant	native	Scrophulariaceae	3/22/2021	FAC
Sedum sp.	ornamental groundcover stone crop	non-native escaped ornamental	Crassulaceae	3/22/2021	
Senecio minimus	Coastal burnweed	non-native	Asteraceae	3/22/2021	FACU
Senecio vulgaris	Common groundsel	non-native	Asteraceae	3/22/2021	FACU
Solanum aviculare	New Zealand nightshade	invasive non-native	Solanaceae	3/22/2021	
Stachys arvensis	Field hedge nettle	non-native	Lamiaceae	3/22/2021	

Stellaria media	Chickweed	non-native	Caryophyllaceae	3/22/2021	FACU
Vaccinium ovatum	evergreen huckleberry	native	Ericaceae	3/22/2021	FACU
Veronica persica	Bird's eye speedwell	non-native	Plantaginaceae	3/22/2021	
Vicia sp.	Vetch		Fabaceae	3/22/2021	
Vinca major	Vinca	invasive non-native	Apocynaceae	3/22/2021	
Zantedeschia aethiopica	Callalily	invasive non-native	Araceae	3/22/2021	OBL

Table 2. Animal Species Observed

Group	Species	Common Name	Status	Date
Avian Species	*Corvus brachyrhynchos*	American crow	native	3/22/2021
	Spinus tristis	American goldfinch	native	3/22/2021
	Corvus corax	Common raven	native	3/22/2021
	Calypte anna	Anna's hummingbird	native	3/22/2021
	Zonotrichia leucophrys	White-crowned sparrow	native	3/22/2021
	Zonotrichia atricapilla	Golden-crowned sparrow	native	3/22/2021
	Sternus vulgaris	European starling	non-native	3/22/2021
	Junco hyemalis	Dark-eyed junco	native	3/22/2021
	Melospiza melodia	Song sparrow	native	3/22/2021
Mammal Species	*Thomomys bottae*	Pocket gopher	native	3/22/2021
	Odocoileus hemionus columbianus	Black-tailed deer	native	3/22/2021

Appendix D. Habitat Photos

Photo 1. Overview of site looking south, with graded and terraced field in center, Monterey pine dominated canopy on southwestern and southeastern margins, and coastal brambles to west.

Photo 2. Non-native Monterey pine dominance at Rapid Assessment point FURT001.

Photo 3. Looking south from Rapid Assessment point FURT001.

Photo 4. Looking east from FURT001 at Monterey pines with California blackberry in understory.

Photo 5. Coastal brambles on western margin of lower field with sweet vernal grass dominance and wild radish hybrids in foreground.

Photo 6. Looking south from Rapid Assessment point FURT002 shows cut Monterey pines overgrown with California blackberry.

Photo 7. Looking north from Rapid Assessment point FURT002 shows cut Monterey pines overgrown with California blackberry and invasive Scotch broom.

Photo 8. Non-native Eucalyptus, short-leaved box, and invasive Scotch broom also occurred on the western margins of the property.

Photo 9. The vicinity of the Scotch broom patch in the center of the property, with highly invasive pampas grass in the center of the photo.

Photo 10. Non-native star acacia on west side of property, not previously known in Humboldt County (based on CalFlora), is highly recommended for removal because species in this genus can be invasive.

Appendix E. Rapid Assessment Data Sheets

Combined Vegetation Rapid Assessment and Relevé Field Form

(Revised March 27, 2018)

Unusual species:

For Office Use:	Final database #:	Final vegetation type:	Alliance Association

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION

circle: Relevé or RA

Database #:	Date:	Name of recorder: Kelsey McDonald
FURT001	3/22/21	Other surveyors:
	UID:	Location Name: Furtado Parcel

GPS name: Area

For Relevé only: Bearing°, left axis at ID point____ of Long / Short side

UTME _____ UTMN _____ Zone: 11 NAD83 GPS error: ft./ m./ PDOP ____

Decimal degrees: LAT ___ ___ . _____ LONG ___ ___ ___ . _____

GPS within stand? Yes / (No) If No, cite from GPS to stand: distance (m) 2m bearing ° ____ inclination ° ____

and record: Base point ID _____ Projected UTMs: UTME _____ UTMN _____

Camera Name: phone Cardinal photos at ID point: NESW 9:28AM

Other photos:

Stand Size (acres): (<1,) 1-5, >5 | Plot Area (m²): 100 / _____ | Plot Dimensions ____ x ____ m | RA Radius 10 m

Exposure, Actual °: _____ NE NW SE SW (Flat) Variable | Steepness, Actual °: _____ 0° 1-5° >5-25° >25

Topography: Macro: top upper mid lower bottom | Micro: convex flat concave undulating

Geology code: _____ Soil Texture code: _____ | Upland or Wetland/Riparian (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)

H20: 0 BA Stems: 25 Litter: 70 Bedrock: Boulder: Stone: Cobble: Gravel: Fines: 5 =100%

% Current year bioturbation _____ Past bioturbation present? Yes / No | % Hoof punch _____

Fire evidence: Yes / No (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments: Characterizing conifer dominated areas (all areas with tree-canopy onsite) along lower margins of field to the east and property boundary to west. RA plot on East side. Young conifers - atleast 50% non-native Monterey pine. Eucalyptus is also a substantial part of the canopy on the western side.

Disturbance code / Intensity (L,M,H): exotics 05 / H ___/___ ___/___ ___/___ ___/___ "Other" _____/___

II. HABITAT DESCRIPTION

Tree DBH : T1 (<1" dbh), T2 (1-6" dbh), T3 (6-11" dbh), T4 (11-24" dbh), T5 (>24" dbh), T6 multi-layered (T3 or T4 layer under T5, >60% cover)

Shrub: S1 seedling (<3 yr. old), S2 young (<1% dead), S3 mature (1-25% dead), S4 decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.), H2 (>12" ht.)

Desert Riparian Tree/Shrub: 1 (<2ft. stem ht.), 2 (2-10ft. ht.), 3 (10-20ft. ht.), 4 (>20ft. ht.)

Desert Palm/Joshua Tree: 1 (<1.5" base diameter), 2 (1.5-6" diam.), 3 (>6" diam.)

III. INTERPRETATION OF STAND

Field-assessed vegetation Alliance name: Pinus radiata Semi-natural Alliance

Field-assessed Association name (optional): _____

Adjacent Alliances/direction: Cytisus scoparius / N, Anthoxanthum odoratum / N, E

Confidence in Alliance identification: L (M) H Explain: P. radiata not native to HumCo - otherwise

Phenology (E,P,L): Herb ___ Shrub ___ Tree ___ Other identification or mapping information: fits P. radiata - P. muricata

Combined Vegetation Rapid Assessment and Relevé Field Form

(Revised March 27, 2018)

Database #: _____ SPECIES SHEET

IV. VEGETATION DESCRIPTION

% NonVasc cover: ____ **Total % Vasc Veg cover:** 90

% Cover - **Conifer tree / Hardwood tree:** 70/0 **Regenerating Tree:** 2 **Shrub:** 20 **Herbaceous:** 20

Height Class - **Conifer tree / Hardwood tree:** 5-6/ – **Regenerating Tree:** 4 **Shrub:** 2 **Herbaceous:** 1

Height classes: 1=<1/2m, 2=1/2-1m, 3=1-2m, 4=2-5m, 5=5-10m, 6=10-15m, 7=15-20m, 8=20-35m, 9=35-50m, 10=>50m

Stratum categories: T=Tree, A = SApling, E = SEedling, S = Shrub, H= Herb, N= Non-vascular

% Cover Intervals for reference: r = trace, + = <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%

Stratum	Species	% cover	C	Final species determination
T	Pinus radiata	50		
T	Pinus contorta	15		
T	Picea sitchensis	18		
	~~Eucalyptus globulus~~			Outside plot on W. side
S	Rubus ursinus	20		
H	Anthoxanthum odoratum	10		
H	Raphanus x hybrids	5		
H	Plantago lanceolata	2		
H	Rumex acetosella	3		
H	Fragaria chiloensis	2		
H	Daucus carota	2		

Unusual species: _____

Combined Vegetation Rapid Assessment and Relevé Field Form

(Revised March 27, 2018)

For Office Use: | **Final database #:** | **Final vegetation type:** Alliance _____ Association _____

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION

circle: **Relevé** or **RA**

Database #	Date	Name of recorder	Other surveyors	UID	Location Name
FURTOC2	2/22/21	K. McDonald			Furtado Parcel

GPS name: Area1

For Relevé only: **Bearing°**, left axis at ID point ____ of **Long / Short** side

UTME _____ **UTMN** _____ **Zone: 11** **NAD83** GPS error: **ft./ m./ PDOP** ____

Decimal degrees: **LAT** _____ **LONG** _____

GPS within stand? **Yes** / (**No**) If No, cite from GPS to stand: distance (m) 1m bearing ° ____ inclination ° ____

and record: **Base point ID** _____ **Projected UTMs: UTME** _____ **UTMN** _____

Camera Name: iphone **Cardinal photos at ID point:** NESW

Other photos:

Stand Size (acres): (<1,) 1-5, >5 | **Plot Area (m²):** 100 / _____ | **Plot Dimensions** ____ x ____ m | **RA Radius** 10 m (within Rubus bands)

Exposure, Actual °: _____ NE NW SE SW (Flat) Variable | **Steepness, Actual °:** _____ (0°) (1-5°) >5-25° >25

Topography: **Macro:** top upper mid (lower) bottom | **Micro:** convex flat concave (undulating)

Geology code: _____ **Soil Texture code:** _____ | (**Upland**) or **Wetland/Riparian** (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)

H20: **BA Stems:** **Litter:** **Bedrock:** **Boulder:** **Stone:** **Cobble:** **Gravel:** **Fines:** **=100%**

% Current year bioturbation _____ **Past bioturbation present?** **Yes / No** | **% Hoof punch** _____

Fire evidence: **Yes / No** (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments: Rubus ursinus has established thick brambles around cut Pinus radiata along SW boundary. Highly disturbed, but good songbird habitat with lots of activity - seasonal avoidance or surveys needed for potential nesting habitat. Appears to be recently established, overgrowing debris piles.

Disturbance code / Intensity (L,M,H): 01 (development (suburban edge)) /M 05 (exotics) /M 27 (wood cutting) /H 07 /H ___/___ **"Other"** _____/___

II. HABITAT DESCRIPTION

Tree DBH : **T1** (<1" dbh), **T2** (1-6" dbh), **T3** (6-11" dbh), **T4** (11-24" dbh), **T5** (>24" dbh), **T6** multi-layered (T3 or T4 layer under T5, >60% cover)

Shrub: **S1** seedling (<3 yr. old), **S2** young (<1% dead), (**S3**) mature (1-25% dead), **S4** decadent (>25% dead)

Herbaceous: **H1** (<12" plant ht.), (**H2**) (>12" ht.)

Desert Riparian Tree/Shrub: **1** (<2ft. stem ht.), **2** (2-10ft. ht.), **3** (10-20ft. ht.), **4** (>20ft. ht.)

Desert Palm/Joshua Tree: **1** (<1.5" base diameter), **2** (1.5-6" diam.), **3** (>6" diam.)

III. INTERPRETATION OF STAND

Field-assessed vegetation Alliance name: Rubus ursinus? Coastal Brambles Alliance?

Field-assessed Association name (optional): _____

Adjacent Alliances/direction: Anthoxanthum odoratum W, Pinus radiata / S

Confidence in Alliance identification: (**L**) **M** **H** **Explain:** Recently part of P. radiata stand, overstory cut

Phenology (E,P,L): **Herb**___ **Shrub**___ **Tree**___ **Other identification or mapping information:**

Combined Vegetation Rapid Assessment and Relevé Field Form

(Revised March 27, 2018)

SPECIES SHEET

Database #: _____

IV. VEGETATION DESCRIPTION

% NonVasc cover: 0 **Total % Vasc Veg cover:** 100

% Cover - **Conifer tree / Hardwood tree:** 25 (dead) / ___ **Regenerating Tree:** 0 **Shrub:** 95 **Herbaceous:** 5

Height Class - Conifer tree / Hardwood tree: 4 / ___ **Regenerating Tree:** E **Shrub:** 3-4 **Herbaceous:** 2

Height classes: 1=<1/2m, 2=1/2-1m, 3=1-2m, 4=2-5m, 5=5-10m, 6=10-15m, 7=15-20m, 8=20-35m, 9=35-50m, 10=>50m

Stratum categories: T=Tree, A = SApling, E = SEedling, S = Shrub, H= Herb, N= Non-vascular

% Cover Intervals for reference: r = trace, + = <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%

Stratum	Species	% cover	C	Final species determination
T	Pinus radiata (dead)	20		
S	Rubus ursinus	90		
S	Cytisus scoparius	2		
H	Scrophularia californica	1		
H	Holcus lanatus	1		
H	Daucus carota	1		
H	Anthoxanthum odoratum	1		
H	Raphanus x	1		
Other	Trash & Garden/Chicken Coop debris	10%		

Unusual species: _____

Appendix F. Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Fiatado Parcel City/County: McKinleyville Sampling Date: 3/22/21

Applicant/Owner: State: CA Sampling Point: Up1

Investigator(s): K. McDonald Section, Township, Range:

Landform (hillslope, terrace, etc.): lower terrace (man-made) Local relief (concave, convex, none): Slightly concave Slope (%): 2

Subregion (LRR): A Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	Is the Sampled Area within a Wetland? Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks: Lowest geomorphic position beneath terrace on W side

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 3m rad.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus contorta	10	Y	FAC
2.			
3.			
4.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: 3m rad)			
1. Rubus ursinus	<1	–	FACU
2. Ilex aquifolium	1	–	FACU
3. Cytisus scoparius	<1	–	UPL
4.			
5.			
	~2 = Total Cover		
Herb Stratum (Plot size: 1m²)			
1. Holcus lanatus	15	Y	FAC
2. Anthoxanthum odoratum	15	Y	FACU
3. Daucus carota	3		FACU
4. Prunella vulgaris	10	Y	FACU
5. Hypochaeris radicata	8		FACU
6. Fragaria chiloensis	5		FACU
7. Trifolium cf. repens	5		FAC
8. Plantago lanceolata	6		FACU
9. Rumex acetosella	1		FACU
10.			
11.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 30 litter

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- N 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

SOIL

Sampling Point: Up1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16"	10YR 2/2	100%	NONE	-	-	-	-	Sandy, 102m

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks: Minor amount of mixing. No redox. Dark, rich, crumbling soil.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Dry, crumbling soil despite recent rains

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Furtado Property City/County: Mckinleyville Sampling Date: 3/22/21
Applicant/Owner: State: CA Sampling Point: Up2
Investigator(s): K. McDonald Section, Township, Range:
Landform (hillslope, terrace, etc.): manmade terrace Local relief (concave, convex, none): Concave Slope (%): 2-5
Subregion (LRR): Lat: Long: Datum:
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks: Mowed field - small concave area below middle terrace, near

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 1m²)			
1. Cytisus scoparius	5	Y	UPL
2. Rubus ursinus	6	Y	FACU
3.			
4.			
5.			
	11 = Total Cover		
Herb Stratum (Plot size: 1m²)			
1. Anthoxanthum odoratum	50	Y	FACU
2. Bromus carinatus	5		UPL
3. Plantago lanceolata	4		FACU
4. Fragaria chiloensis	6		FACU
5.			
6. Rumex acetosella	2		FACU
7. Linum bienne	1		
8. Holcus lanatus	5		FAC
9. Hypochaeris radicata	2		FACU
10.			
11.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 15

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
__ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
__ 3 - Prevalence Index is ≤3.0[1]
__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ 5 - Wetland Non-Vascular Plants[1]
__ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

SOIL

Sampling Point: Up2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/2	100	None	—	—	—	Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No ✓

Remarks: Rich dark sandy loam, well drained. No redox

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): _____

Water Table Present? Yes ____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Dry, crumbling soil in low geomorphic position. No hydrology.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Furtado Property City/County: McKinleyville Sampling Date: 3/22/21

Applicant/Owner: State: CA Sampling Point: UP3

Investigator(s): H. McDonald Section, Township, Range:

Landform (hillslope, terrace, etc.): lowest area-outsloped fill Local relief (concave, convex, none): none Slope (%): 45

Subregion (LRR): A Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks: lowest point on property- NE corner

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 1m)			
1. Prunella vulgaris	25	Y	FACU
2. Anthoxanthum odoratum	30	Y	FACU
3. Rumex acetosella	10		FACU
4. Holcus lanatus	2		FAC
5. Bromus diandrus	5		UPL
6. Ripgut brome	5		UPL
7. Plantago lanceolata	5		FACU
8. Hypochaeris radicata	3		FACU
9.			
10.			
11.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 15%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species ____	x 3 =	____
FACU species ____	x 4 =	____
UPL species ____	x 5 =	____
Column Totals: ____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- N 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

SOIL

Sampling Point: Up3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR2/2	100	None	—	—	—	Sandy loam	some charcoal present

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks: Dark rich soil, no redox

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Dry to 16", appears to be well-drained

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Humboldt County, Central Part, California

Furtado Parcel

March 24, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,340 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Humboldt County, Central Part, California
Survey Area Data: Version 6, Jun 1, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 8, 2019—Jun 21, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
225	Arcata and Candymountain soils, 0 to 2 percent slopes	7.7	100.0%
Totals for Area of Interest		**7.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Humboldt County, Central Part, California

225—Arcata and Candymountain soils, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2lmt0
Elevation: 10 to 290 feet
Mean annual precipitation: 35 to 90 inches
Mean annual air temperature: 52 to 55 degrees F
Frost-free period: 275 to 325 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Arcata and similar soils: 50 percent
Candymountain and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arcata

Setting

Landform: Marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Marine deposits derived from mixed

Typical profile

A - 0 to 23 inches: fine sandy loam
AB - 23 to 37 inches: very fine sandy loam
Bw - 37 to 51 inches: fine sandy loam
C - 51 to 67 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F004BX121CA - Redwood-Sitka spruce/salal-California huckleberry/western swordfern, marine terraces, marine deposits, sandy loam an
Hydric soil rating: No

Description of Candymountain

Setting

Landform: Marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Marine deposits derived from mixed

Typical profile

A1 - 0 to 11 inches: fine sandy loam
A2 - 11 to 19 inches: fine sandy loam
Bt1 - 19 to 38 inches: fine sandy loam
Bt2 - 38 to 48 inches: fine sandy loam
BCt - 48 to 55 inches: sandy loam
C - 55 to 63 inches: loamy fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 8.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F004BX121CA - Redwood-Sitka spruce/salal-California huckleberry/western swordfern, marine terraces, marine deposits, sandy loam an
Hydric soil rating: No

Minor Components

Urban land, residential

Percent of map unit: 4 percent
Landform: Marine terraces
Hydric soil rating: No

Timmons

Percent of map unit: 3 percent
Landform: Marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F004BX121CA - Redwood-Sitka spruce/salal-California huckleberry/western swordfern, marine terraces, marine deposits, sandy loam an

Hydric soil rating: No

Halfbluff

Percent of map unit: 3 percent
Landform: Marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F004BX118CA - Sitka spruce-redwood/salal/western brackenfern, marine terraces, marine deposits, fine sandy lo
Hydric soil rating: No

Megwil,

Percent of map unit: 3 percent
Landform: Marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F004BX120CA - Redwood-Sitka spruce/California huckleberry-salmonberry/western swordfern-deer fern, marine terraces, loam
Hydric soil rating: No

Talawa

Percent of map unit: 2 percent
Landform: Marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

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WETS Table

WETS Station: EUREKA WFO WOODLEY ISLAND, CA								
Requested years: 1971 - 2000								
Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall
Jan	55.3	41.9	48.6	5.97	3.67	7.22	11	0.1
Feb	56.3	43.2	49.7	5.51	3.57	6.63	11	0.2
Mar	56.4	43.6	50.0	5.54	3.80	6.61	11	0.0
Apr	57.4	45.0	51.2	2.91	1.77	3.52	7	0.0
May	59.4	48.0	53.7	1.62	0.85	1.98	4	0.0
Jun	61.4	50.6	56.0	0.65	0.29	0.79	2	0.0
Jul	62.9	52.7	57.8	0.16	0.05	0.17	0	0.0
Aug	63.9	53.5	58.7	0.38	0.07	0.35	1	0.0
Sep	63.7	51.7	57.7	0.86	0.20	0.91	2	0.0
Oct	61.4	48.4	54.9	2.36	1.12	2.89	5	0.0
Nov	58.1	44.6	51.4	5.78	3.36	7.02	10	0.0
Dec	55.3	41.4	48.4	6.35	3.52	7.74	11	0.1
Annual:					31.65	43.02		
Average	59.3	47.0	53.2	-	-	-	-	-
Total	-	-	-	38.10			75	0.3

GROWING SEASON DATES			
Years with missing data:	24 deg = 0	28 deg = 0	32 deg = 0
Years with no occurrence:	24 deg = 30	28 deg = 28	32 deg = 2
Data years used:	24 deg = 30	28 deg = 30	32 deg = 30
Probability	24 F or higher	28 F or higher	32 F or higher
50 percent *	No occurrence	No occurrence	1/24 to 12/17: 327 days
70 percent *	No occurrence	No occurrence	1/12 to 12/29: 351 days
* Percent chance of the growing season occurring between the Beginning and Ending dates.			

STATS TABLE - total precipitation (inches)													
Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
1886												9.78	9.78
1887	8.86	9.00	2.28		3.51	1.92	0.06	0.07	0.21	0.55	2.66	5.43	34.55
1888	12.95	1.98	4.09		0.76	4.66	0.44	0.00	0.06	1.15	3.41	5.93	35.43
1889	4.25	1.93	5.91		7.27	0.37	0.15	0.13	0.32	8.36	3.71	12.88	45.28
1890	18.26	13.88	11.57	1.43	1.71	0.90	0.08	0.02	0.79	0.44	0.18	5.48	54.74
1891	3.33	9.81	5.83	6.37	1.55	1.53	0.28	0.31	1.45	1.64	2.72	10.97	45.79
1892	3.29	2.53	5.32		3.63	0.45	0.00	0.09	0.99	2.90	8.19	6.55	33.94
1893	3.65	6.27	10.59	2.99	2.43	0.33	0.00	0.00	2.39	4.33	9.87	6.69	49.54

1894	12.38	6.13	7.46	M1.28	1.31	1.67	0.02	0.04	1.84	3.12	2.03	12.31	49.59
1895	9.37	3.60	5.31	2.88	5.39	0.06	0.23	0.11	3.14	0.05	3.88	7.50	41.52
1896	8.14	4.61	6.93	6.88	6.22	0.51	0.00	0.70	1.60	2.37	8.00	9.41	55.37
1897	3.04	11.23	9.85	1.36	0.75	1.60	0.03	0.15	1.05	2.63	5.44	6.18	43.31
1898	3.23	8.00	1.80	1.82	2.62	1.21	0.00	0.06	1.48	2.13	4.43	3.17	29.95
1899	6.50	5.03	8.53	1.91	1.73	0.75	0.00	0.42	0.88	4.28	14.80	7.05	51.88
1900	6.63	6.04	3.42	4.43	2.08	1.70	T	0.07	0.21	7.07	8.01	5.27	44.93
1901	9.93	7.41	3.86	4.08	1.50	0.12	0.03	T	4.26	2.46	3.96	4.43	42.04
1902	1.95	19.49	7.85	4.56	2.70	0.27	0.25	T	0.14	2.34	10.88	8.33	58.76
1903	16.07	3.80	7.42	1.23	0.70	0.57	0.06	0.53	0.28	2.42	10.79	4.03	47.90
1904	5.24	16.10	19.05	5.14	1.02	0.55	0.75	T	1.36	2.67	4.41	8.18	64.47
1905	4.81	0.99	7.41	0.78	1.99	0.12	0.02	0.00	0.38	1.50	3.93	4.32	26.25
1906	7.63	6.27	7.72	2.14	3.57	1.56	0.01	0.01	0.76	0.67	3.13	7.59	41.06
1907	10.40	10.57	11.83	3.30	1.69	0.58	T	2.66	0.63	1.48	2.38	8.59	54.11
1908	7.23	6.59	2.82	0.85	2.57	0.19	T	0.16	0.02	5.09	3.97	3.91	33.40
1909	14.41	11.54	2.72	0.24	0.76	0.14	0.55	T	0.61	3.78	12.60	4.29	51.64
1910	7.26	7.33	1.97	0.83	0.64	0.49	0.00	0.00	0.01	0.82	6.86	3.43	29.64
1911	8.63	3.75	1.45	3.39	3.52	0.23	T	0.08	0.29	1.68	2.09	4.74	29.85
1912	10.17	5.73	4.73	5.92	1.98	1.29	0.05	0.04	2.40	1.55	6.86	5.83	46.55
1913	8.10	0.87	3.61	3.41	1.67	1.60	0.28	0.03	0.48	0.88	5.29	7.58	33.80
1914	9.75	4.20	3.13	3.27	0.70	1.73	0.01	T	1.82	3.79	2.42	7.09	37.91
1915	9.75	12.39	1.65	1.38	2.07	0.05	0.26	0.00	0.11	0.79	6.15	5.19	39.79
1916	13.02	5.18	4.83	1.98	1.48	1.00	1.34	0.12	0.38	0.47	3.13	5.47	38.40
1917	5.53	5.10	5.01	3.78	1.02	0.00	0.00	0.02	0.66	0.00	6.43	1.17	28.72
1918	2.55	6.29	5.84	1.15	0.29	0.02	0.22	0.21	1.42	1.00	4.74	4.29	28.02
1919	7.84	8.18	6.25	4.03	1.48	0.14	0.01	0.01	1.52	0.24	2.99	4.33	37.02
1920	1.87	2.11	5.79	3.12	0.04	1.92	0.13	0.49	2.47	4.11	6.35	10.83	39.23
1921	8.37	7.45	3.04	1.67	2.54	1.30	0.00	0.01	0.27	1.59	6.21	4.48	36.93
1922	2.54	9.75	6.43	2.39	0.95	0.14	0.00	0.03	0.37	3.38	3.32	7.62	36.92
1923	3.88	0.50	0.80	2.95	1.26	1.07	0.03	0.02	1.54	2.55	2.86	4.93	22.39
1924	1.95	3.19	2.85	0.67	0.08	0.05	0.02	1.03	0.41	6.84	6.37	4.07	27.53
1925	3.97	6.49	2.02	7.47	2.57	0.24	T	0.25	3.56	0.95	3.71	4.84	36.07
1926	4.69	6.64	0.07	0.94	1.13	T	0.01	0.54	0.43	3.49	13.65	6.47	38.06
1927	5.83	10.30	3.95	3.32	1.68	0.91	0.00	0.02	0.86	1.17	5.89	3.10	37.03

1928	3.40	2.78	7.01	5.86	0.12	0.32	0.02	0.05	M0.58	2.21	4.90	7.82	35.07
1929	4.31	2.06	2.31	2.61	0.14	2.39	T	0.01	0.00	0.21	T	7.13	21.17
1930	6.32	4.92	1.23	2.54	1.04	0.13	T	T	1.12	1.21	3.20	2.50	24.21
1931	4.09	2.39	3.35	1.61	0.49	1.33	0.01	0.01	0.54	2.28	5.75	9.06	30.91
1932	6.84	1.20	4.54	4.87	1.41	0.11	0.14	0.03	0.01	1.32	5.11	5.54	31.12
1933	7.04	M2.93	7.20	0.97	4.23	0.30	T	0.05	0.70	2.08	0.38	6.50	32.38
1934	3.83	2.31	3.61	1.68	1.23	0.29	T	0.01	0.47	3.98	8.63	5.28	31.32
1935	7.25	2.73	5.60	4.86	0.30	0.27	0.09	T	1.10	3.02	1.35	6.79	33.36
1936	8.84	5.89	1.77	2.13	2.23	1.34	0.09	T	0.04	0.49	0.01	3.97	26.80
1937	4.27	5.41	7.19	6.55	0.88	1.35	0.03	0.05	0.19	4.33	10.95	4.26	45.46
1938	6.28	13.94	13.97	2.23	0.31	0.01	T	T	1.74	3.34	3.12	5.97	50.91
1939	4.49	4.41	5.03	0.37	1.85	0.56	0.23	0.06	0.05	1.82	0.91	12.13	31.91
1940	4.37	9.62	7.47	0.81	2.54	0.32	0.00	0.00	0.91	4.03	2.29	8.87	41.23
1941	11.37	6.68	4.31	4.49	3.61	1.52	0.06	0.18	0.48	2.64	3.91	12.87	52.12
1942	4.08	6.22	1.77	4.05	5.43	0.57	0.07	0.06	0.06	1.21	8.60	8.52	40.64
1943	5.23	3.51	5.83	3.23	4.25	0.47	0.04	0.21	0.01	4.61	3.59	1.67	32.65
1944	2.92	3.62	2.25	4.25	3.49	1.19	0.10	0.19	0.19	2.79	9.11	5.92	36.02
1945	3.64	9.55	6.03	2.27	3.43	T	T	0.10	1.09	3.38	9.47	9.93	48.89
1946	4.32	5.10	4.68	0.42	1.26	0.30	0.12	0.01	0.32	2.26	4.36	1.56	24.71
1947	3.93	1.33	3.91	1.84	0.17	1.58	1.20	0.10	0.59	6.50	1.72	3.09	25.96
1948	8.23	5.20	6.16	6.53	2.16	0.77	0.25	0.13	1.71	3.33	3.19	7.35	45.01
1949	1.63	6.09	6.94	0.41	2.56	0.06	0.16	0.02	0.50	2.03	3.23	4.49	28.12
1950	13.79	4.61	7.71	1.93	1.30	1.03	0.05	0.07	0.35	13.04	3.43	5.99	53.30
1951	8.47	7.56	3.94	2.05	1.38	T	0.05	0.02	0.79	3.88	7.80	9.10	45.04
1952	10.67	6.22	3.78	1.34	1.77	1.98	T	0.01	0.73	0.62	2.13	11.87	41.12
1953	12.63	3.44	5.95	3.18	5.83	1.24	T	0.41	0.61	3.84	9.57	3.62	50.32
1954	11.78	3.29	3.76	2.78	0.16	2.57	0.04	1.24	0.87	1.47	5.09	9.65	42.70
1955	5.73	1.83	1.82	5.56	0.03	0.11	0.21	T	1.18	2.64	5.77	11.63	36.51
1956	11.51	7.47	2.36	0.31	1.58	1.71	0.06	T	0.33	5.47	0.49	7.18	38.47
1957	4.22	4.36	8.77	1.96	3.42	0.30	0.34	0.02	1.37	6.00	4.44	5.69	40.89
1958	8.57	10.80	6.09	3.67	1.26	0.71	0.05	T	0.78	1.17	3.71	4.06	40.87
1959	7.23	10.65	3.37	0.52	0.91	0.25	T	0.01	1.54	0.74	0.28	3.64	29.14
1960	3.87	7.48	8.13	2.92	6.05	T	0.02	0.04	0.01	1.31	9.87	5.08	44.78
1961	4.54	7.53	7.90	3.49	3.97	0.50	0.03	0.30	0.53	2.28	5.65	3.44	40.16

1962	3.26	6.08	4.04	2.62	0.60	0.11	T	1.92	0.71	6.49	6.77	2.58	35.18
1963	1.70	4.74	6.28	10.68	1.74	0.33	0.11	0.07	0.68	5.41	6.91	3.20	41.85
1964	11.13	1.20	5.91	0.67	1.59	0.72	0.83	0.03	0.07	1.82	12.11	10.96	47.04
1965	5.82	1.36	1.23	5.60	0.44	0.35	T	0.36	T	0.70	5.20	5.22	26.28
1966	9.44	3.12	6.57	1.34	0.06	0.30	0.25	0.50	1.33	1.02	9.86	6.52	40.31
1967	8.87	1.47	7.44	5.29	1.52	0.32	0.00	T	1.32	2.15	4.40	4.34	37.12
1968	7.59	2.93	3.85	0.40	1.04	0.20	0.04	1.98	0.60	2.81	5.88	8.32	35.64
1969	13.92	7.82	1.56	3.22	1.01	0.34	0.05	T	0.36	3.20	3.49	9.60	44.57
1970	12.46	3.15	2.70	1.54	1.38	0.29	T	T	0.32	2.11	13.20	10.24	47.39
1971	5.41	3.28	7.91	2.92	1.28	1.51	0.16	0.55	2.08	0.92	6.36	6.38	38.76
1972	7.96	5.93	5.08	2.27	1.11	0.88	0.01	0.07	1.06	1.97	5.41	7.42	39.17
1973	6.47	3.85	7.10	0.35	0.85	0.23	T	0.08	2.35	4.14	16.58	7.02	49.02
1974	6.02	5.98	6.98	3.15	0.42	0.33	0.11	0.32	T	1.76	2.75	6.40	34.22
1975	5.20	7.68	10.73	3.29	1.05	0.58	0.10	0.58	0.01	6.77	4.72	5.38	46.09
1976	1.88	7.51	3.12	2.80	0.54	0.14	0.20	1.70	0.04	0.28	2.98	0.52	21.71
1977	1.90	2.24	4.33	1.20	2.10	0.07	T	0.20	3.35	2.79	4.51	6.60	29.29
1978	4.52	6.06	2.88	4.10	0.82	0.34	0.03	0.59	2.72	0.04	2.39	1.16	25.65
1979	3.82	6.26	1.70	3.94	2.25	0.05	0.31	0.13	1.15	6.14	6.19	3.75	35.69
1980	3.19	4.67	6.14	4.18	1.70	0.42	T	0.07	0.14	1.38	2.49	6.10	30.48
1981	7.67	3.72	4.64	0.71	2.02	0.57	T	0.01	0.97	3.71	9.39	9.88	43.29
1982	4.75	5.76	7.06	5.97	0.07	0.78	0.08	0.03	0.62	4.89	7.83	10.30	48.14
1983	8.48	9.18	10.73	5.47	1.12	0.65	0.89	3.42	0.87	1.87	10.40	14.13	67.21
1984	0.76	5.18	4.70	2.76	2.51	1.07	0.03	0.05	0.55	3.67	15.15	4.27	40.70
1985	0.66	3.69	4.68	0.45	1.14	0.89	0.15	0.52	1.06	4.07	2.98	2.78	23.07
1986	7.19	10.08	6.12	1.46	2.34	0.21	0.02	T	2.70	1.75	1.85	3.83	37.55
1987	6.48	3.38	6.10	1.15	0.41	0.26	0.20	0.06	0.02	1.05	4.23	10.92	34.26
1988	7.13	0.54	1.18	2.06	2.70	2.22	0.05	T	0.12	0.41	8.93	6.26	31.60
1989	4.71	2.88	7.63	2.01	1.67	0.21	0.08	0.13	0.85	2.90	1.60	0.80	25.47
1990	7.20	4.50	3.30	1.41	3.74	0.32	0.22	0.71	0.19	1.73	3.07	2.91	29.30
1991	1.65	2.75	6.94	2.52	2.16	0.26	1.13	0.37	T	1.06	1.95	2.36	23.15
1992	3.99	3.80	3.51	2.42	0.06	1.27	0.25	0.01	0.33	2.08	2.21	9.33	29.26
1993	7.15	5.93	4.72	5.94	4.44	1.23	0.37	0.54	0.03	0.56	1.35	7.12	39.38
1994	5.09	7.12	2.06	3.30	1.10	0.71	0.08	T	0.06	0.54	8.21	7.00	35.27
1995	12.74	1.40	11.18	7.47	1.21	1.85	0.08	0.22	0.69	0.53	2.26	11.56	51.19

1996	10.74	8.11	3.51	4.64	2.40	0.05	0.03	T	1.21	3.50	5.16	21.26	60.61
1997	8.81	2.55	2.73	3.06	0.90	1.25	T	0.84	2.05	2.73	7.39	4.73	37.04
1998	13.42	13.95	7.83	2.23	3.12	0.33	0.16	0.01	0.08	3.06	14.09	5.40	63.68
1999	4.37	10.32	8.94	1.79	1.62	0.15	0.04	0.30	0.05	1.60	7.36	3.02	39.56
2000	9.71	7.00	2.81	2.15	1.86	0.54	0.04	T	0.55	2.99	3.51	1.97	33.13
2001	3.79	3.60	2.45	2.54	0.71	0.69	0.20	0.21	0.28	1.00	7.71	11.56	34.74
2002	6.37	5.76	4.32	2.42	0.55	0.28	0.03	0.01	0.06	0.06	2.66	23.31	45.83
2003	5.51	3.84	4.91	11.25	1.74	0.04	0.02	0.49	0.35	0.55	5.78	11.35	45.83
2004	6.29	8.12	2.38	1.68	1.37	0.06	0.06	0.43	0.68	5.71	1.87	9.43	38.08
2005	5.91	2.41	6.24	4.70	3.90	3.08	0.05	0.07	0.08	2.40	8.52	12.72	50.08
2006	12.09	6.34	11.11	4.08	1.03	0.35	0.04	T	0.09	0.58	7.41	7.09	50.21
2007	1.86	11.86	2.51	2.72	0.86	0.46	0.97	0.08	0.60	4.92	2.33	7.30	36.47
2008	9.70	2.73	3.16	2.12	0.04	0.24	0.02	0.47	0.05	0.93	4.05	6.66	30.17
2009	1.58	6.20	5.45	1.23	2.93	0.18	0.06	0.02	1.03	1.95	4.15	4.17	28.95
2010	9.29	4.20	6.06	7.76	3.51	2.31	0.04	0.15	1.39	4.26	4.69	10.08	53.74
2011	2.23	3.62	11.88	4.07	1.43	1.29	0.17	0.04	0.37	4.21	3.86	2.22	35.39
2012	7.76	2.63	12.02	4.76	0.77	2.00	0.67	0.07	0.04	2.72	6.36	10.97	50.77
2013	2.57	1.78	3.09	2.44	1.17	0.43	0.00	0.08	3.14	0.05	1.29	0.56	16.60
2014	1.35	6.09	6.25	1.37	0.58	0.35	0.02	0.02	3.09	4.74	3.89	9.75	37.50
2015	1.36	5.04	3.21	2.57	0.07	0.04	0.15	0.41	0.27	1.18	4.88	14.66	33.84
2016	12.06	2.98	8.11	2.84	0.76	0.02	0.54	0.04	0.01	10.92	6.98	7.87	53.13
2017	10.51	11.10	7.97	5.46	1.31	0.59	0.07	0.05	1.01	1.64	7.40	1.94	49.05
2018	7.86	2.87	8.50	5.02	0.79	0.70	0.03	0.05	0.19	0.85	4.94	4.95	36.75
2019	6.67	14.43	4.79	2.51	2.61	0.00	0.00	0.18	1.92	1.51	1.75	7.63	44.00
2020	7.50	0.60	3.69	2.05	4.73	0.20	0.03	0.08	0.74	0.41	2.55	3.96	26.54
2021	7.10	4.32	M3.93										15.35
Notes: Data missing in any month have an "M" flag. A "T" indicates a trace of precipitation.													
Data missing for all days in a month or year is blank.													
Creation date: 2016-07-22													

U.S. Fish and Wildlife Service

National Wetlands Inventory

Furtado Parcel Vicinity NWI Map

March 24, 2021

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Appendix I. Recommended Mitigation Measure for Potential Impacts to Nesting Birds

Mitigation Measure BIO-1: Protect Special Status, Migratory, and Nesting Birds

Ground disturbance and vegetation clearing shall be conducted, if possible, during the fall and/or winter months and outside of the avian nesting season (March 15 – August 15) to avoid any direct effects to special status and protected birds. If ground disturbance cannot be confined to work outside of the nesting season, a qualified ornithologist shall conduct pre-construction surveys within the vicinity of the project area, to check for nesting activity of native birds and to evaluate the site for presence of raptors and special status bird species. The ornithologist shall conduct at minimum a one day pre-construction survey within the 7 - day period prior to vegetation removal and ground-disturbing activities. If ground disturbance and vegetation removal work lapses for seven days or longer during the breeding season, a qualified ornithologist shall conduct a supplemental avian pre-construction survey before project work is reinitiated.

If active nests are detected within the construction footprint or within 500 feet of construction activities, the ornithologist shall flag a buffer around each nest. Construction activities shall avoid nest sites until the ornithologist determines that the young have fledged or nesting activity has ceased. If nests are documented outside of the construction (disturbance) footprint, but within 500 feet of the construction area, buffers would be implemented as needed. In general, the buffer size for common species would be determined on a case-by-case basis in consultation with the CDFW and, if applicable, with USFWS. Buffer sizes would take into account factors such as (1) noise and human disturbance levels at the construction site at the time of the survey and the noise and disturbance expected during the construction activity; (2) distance and amount of vegetation or other screening between the construction site and the nest; and (3) sensitivity of individual nesting species and behaviors of the nesting birds.

If active nests are detected during the survey, the qualified ornithologist shall monitor all nests at least once per week to determine whether birds are being disturbed. Activities that might, in the opinion of the qualified ornithologist, disturb nesting activities (e.g., excessive noise), shall be prohibited within the buffer zone until such a determination is made. If signs of disturbance or distress are observed, the qualified ornithologist shall immediately implement adaptive measures to reduce disturbance. These measures may include, but are not limited to, increasing buffer size, halting disruptive construction activities in the vicinity of the nest until fledging is confirmed or nesting activity has ceased, placement of visual screens or sound dampening structures between the nest and construction activity, reducing speed limits, replacing and updating noisy equipment, queuing trucks to distribute idling noise, locating vehicle access points and loading and shipping facilities away from noise-sensitive receptors, reducing the number of noisy construction activities occurring simultaneously, and/or reorienting and/or relocating construction equipment to minimize noise at noise-sensitive receptors.