Botanical Report

Ferndale Drainage Project

City of Ferndale

August 09, 2022

Botanical Report
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This document has been prepared for:

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Appendices

1. Summary

GHD prepared this Botanical Report and accompanying appendices on behalf of the City of Ferndale (City), in support of the proposed Ferndale Drainage Project (Project) located in the City of Ferndale, California (**Appendix A, Figure 1**). This Botanical Report summarizes the final results of the 2022 botanical survey and habitat assessment conducted within the Project Study Boundary (PSB). The initial protocol-level early-blooming spring survey was conducted April 05, 2022, and later-blooming summer survey was conducted June 28, 2022. The surveys were appropriately timed to identify early- and late-blooming special status plants with potential to occur within the PSB according to California Department of Fish and Wildlife (CDFW) protocol (CDFW 2018). No special status plants, Sensitive Natural Communities (SNCs), or riparian habitat was observed in the PSB.

2. Introduction

This report supports the Project's environmental documentation, permitting, and construction planning as deemed appropriate. The proposed PSB includes the proposed area of impact which encompasses 6.53 acres (**Appendix A, Figure 2**). This report is subject to, and must be read in conjunction with, the limitations set out in Section 5, Special Terms and Conditions, and the assumptions and qualifications contained throughout the report.

2.1 Project Description

The proposed Project involves replacing the existing storm drain inlets with new inlets that include a combination of water quality treatment improvements (such as increased stormwater retention features) and tree planting on Arlington Avenue. A new storm drain pipe would be installed subsurface along Arlington Avenue, conveying runoff to a new storm drain pipe on 5th Street. A manhole would be installed at the junction of the Arlington Avenue and 5th Street drainage pipelines. The 5th Street pipe alignment would transition to a vegetated swale along the frontage of the fairgrounds with culvert/pipe crossings at existing pedestrian and vehicle access points to the fairgrounds parking lot. Existing pavement in areas not identified as pedestrian or vehicle access points, would be removed, further improving stormwater retention and groundwater recharge. The proposed swale would tie into the existing drainage ditch alignment and the existing ditch would be graded to conform to the proposed swale geometry near the intersections of 5th Street and Van Ness Avenue. Runoff would then flow to the existing culvert under Van Ness Avenue, which would remain in place. After exiting the culvert, runoff would flow through over 500 feet of vegetated swale and detention basin.

2.2 Project Location

The Project is located in the City of Ferndale, Humboldt County, California (**Appendix A, Figure 1**). The PSB is comprised of roadway shoulders, including: Arlington Ave, 5th Street, a small portion of Van Ness Ave, and an adjacent agricultural pasture to the north (**Appendix A, Figure 2**). Trees and other woody vegetation were documented within the PSB, particularly along northern 5th Street and Van Ness Avenue. The northern portion of the PSB (agricultural pasture) is within the mapped FEMA 100-year and 500-year flood zones (FEMA 2022).

3. Regulatory Background

3.1 Federally Listed Species

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

3.2 State Listed Species

Special status plant species under 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
– CRPR rare plants on the 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 (Section 2062 and 2067), and CDFW has oversight of these special status plant species as a trustee agency. Such species are considered during the California Environmental Quality Act (CEQA) process. Plants on CNPS Lists 3 and 4 do not have formal protection under CEQA but may merit consideration in certain circumstances such as if they have limited distribution, have not been previously observed locally, or are considered regionally rare or unique (CNPS 2020). CDFW publishes and periodically updates lists of special status species which include all taxa of concern that are tracked by CDFW. Additionally, locally significant plants (CEQA Guidelines, Section 15125, subd. (c)), or as c) are considered special status plant species (CDFW 2018).

3.3 California Coastal Act

The Coastal Act defines an “environmentally sensitive habitat area” (ESHA) as an “area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments” (Section 30107.5). Three important elements define an ESHA:

1. A geographic area can be designated ESHA because of the presence of individual species of plants or animals or because of the presence of a particular habitat;
2. In order for an area to be designated as ESHA, the species or habitat must be either rare or it must be especially valuable; and,
3. The area must be easily disturbed or degraded by human activities.

Section 30240 states in part that:

a. ESHA shall be protected against significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such areas.

b. Development in areas adjacent to ESHA and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas and shall be compatible with the continuance of those habitat and recreation areas.

While there is not a specific list of habitats considered to be ESHA for the state or county, the California Coastal Commission (CCC) through the Coastal Act and counties or municipalities through Local Coastal Plans (i.e. the Eel River Area Plan [ERAP] within the northern portion of the PSB) are the jurisdictional agencies that exert authority in identifying and protecting ESHA during project review and permitting. The PSB is entirely within the Local Jurisdiction of the Coastal Zone, and therefore the jurisdictional agency is Humboldt County via the ERAP.

3.4 Eel River Area Local Coastal Plan

The Project Area is within the Local Jurisdiction of the Coastal Zone, which is regulated by Humboldt County under the Eel River Area Local Coastal Plan (ERAP) under the Coastal Act.

The ERAP (certified in 1982) uses the Coastal Act definition of wetlands (Ch.3, p.30), and states “No land use or development shall be permitted in areas adjacent to coastal wetlands, called Wetland Buffer Areas, which degrade the wetland or detract from the natural resource value” (Ch.3, p.31, Humboldt County 2014). The Local Coastal Plan provides specific examples of ESHA within the Eel River Area coastal zone (Ch.3, p.28):

a. Environmentally sensitive habitats within the Eel River Planning Area include:

(1) Rivers, creeks, and associated riparian habitats;

(2) Estuaries, sloughs, and wetlands;.

(3) Rookeries for herons and egrets;

(4) Harbor seal pupping areas;

(5) Critical habitats for rare or endangered species listed on State or Federal lists.

3.5 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 2022a). Sensitive Natural Communities have been classified in this document at the alliance level according to *A Manual of California Vegetation* (Sawyer et al. 2009), which describes California vegetation types, also known as “natural communities,” and categorizes them into a hierarchical structure of alliances and associations. 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 2022a). CDFW considers vegetation communities with a NatureServe State Rank of S1 to S3 to be SNCs, and therefore these alliances are considered during the CEQA process (CDFW 2022a). State ranks S1-S5 are defined as follows (CDFW 2022b):

– S1 = Critically Imperiled – Critically imperiled in the State because of extreme rarity (often five or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the State.

– S2 = Imperiled – Imperiled in the State because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the State.
– S3 = Vulnerable – Vulnerable in the State due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
– S4 = Apparently Secure – Uncommon but not rare; some cause for long-term concern due to declines or other factors.
– S5 = Secure – Common, widespread, and abundant in the State.

3.6 Riparian Habitat

Riparian habitat may be subject to local regulation by the City of Ferndale, at the state level by CDFW, and by the North Coast Regional Waterboard. However, no riparian habitat was observed within the PSB.

4. Methodology

4.1 Pre-Survey Investigations

Database searches for special status plant species and SNCs with recorded occurrences in the Project vicinity (six-quad search area) was conducted by GHD on January 18, 2022. The six-quad search area was centered on the Project U.S. Geological Survey 7.5-minute quadrangle (Ferndale) and include the surrounding five quadrangles (Capetown, Taylor Peak, Fortuna, Fields Landing, and Cannibal Island). Databases queries were from CDFW's CNDDB (CDFW 2022b), the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Vascular Plants (CNPS 2022) and the resource list of Federally protected plant species maintained by the USFWS Information for Planning and Consultation (USFWS 2022). The CNDDB Rare Find database and mapping via the Biogeographic Information and Observation System (BIOS) were also consulted for further information on rare plant occurrences documented in the Project vicinity. Database query results are included as **Appendix B**.

The resulting database scoping query yielded 27 special status plant species with a CRPR rank of 1 or 2, including three federally Endangered species and three state Endangered species, and three SNCs (**Tables 4-1, 4-2**). Each species' potential to occur within the PSB was assessed based on habitat availability and previously documented occurrences. Of the special status plant species identified during scoping, zero have a high probability of occurring within the PSB, one has a moderate probability of occurring within the PSB, six have a low probability of occurring within the PSB, and 20 have no potential of occurring within the PSB due to absence of suitable habitat. Of the three SNCs identified during scoping, all three have no potential to occur within the PSB due to lack of suitable habitat. See **Table 4-1** for the Special Status Plant Species Potential to Occur, and **Table 4-2** for the Sensitive Natural Communities Potential to Occur which lists the special status plant species and SNCs scoped within the six-quad search area and each species ranked potential to occur within the PSB (no, low, moderate or high potential).

Table 4-1 Special Status Plant Species Potential to Occur

Scientific Name	Common Name	FESA	CESA	Global Rank[2]	State Rank[2]	CRPR[2]	Habitat Requirements[1]	Potential to Occur in the PSB
Abronia umbellata var. breviflora	pink sand-verbena	None	None	G4G5T2	S2	1B.1	Coastal dunes	**No Potential.** There is no suitable habitat in the PSB.
Angelica lucida	sea-watch	None	None	G5	S3	4.2	Coastal bluff scrub | Coastal dunes | Coastal scrub | Marshes and swamps	**No Potential.** There is no suitable habitat in the PSB.
Anomobryum julaceum	slender silver moss	None	None	G5?	S2	4.2	Broadleafed upland forest | Lower montane coniferous forest | North Coast coniferous forest	**No Potential.** The PSB is outside of the elevational range for this species (330 -3,280 feet).
Astragalus pycnostachyus var. pycnostachyus	coastal marsh milk-vetch	None	None	G2T2	S2	1B.2	Coastal dunes | Coastal scrub | Marsh & swamp | Wetland	**Low Potential.** Wetland habitat is present within the PSB; however, this species is more associated with the coast.
Calamagrostis foliosa	leafy reed grass	None	CR	G3	S3	4.2	Coastal bluff scrub | North Coast coniferous forest | Rocky soils	**No Potential.** There is no suitable habitat in the PSB.
Carex leptalea	bristle-stalked sedge	None	None	G5	S1	2B.2	Bog & fen | Freshwater marsh | Marsh & swamp | Meadow & seep | Wetland	**Low Potential.** Wetland habitat is present within the PSB; however, this species is more associated with bogs.
Carex lyngbyei	Lyngbye's sedge	None	None	G5	S3	2B.2	Marsh & swamp | Wetland	**Low Potential.** This species was observed two miles west of the PSB along the Salt River in 2010 (CNDDB 2022). Wetland habitat is present within the PSB, but may not be brackish enough to support this species.
Castilleja ambigua var. humboldtiensis	Humboldt Bay owl's-clover	None	None	G4T2	S2	1B.2	Marsh & swamp | Salt marsh | Wetland	**No Potential.** There is no suitable habitat in the PSB.

Scientific Name	Common Name	FESA	CESA	Global Rank[2]	State Rank[2]	CRPR[2]	Habitat Requirements[1]	Potential to Occur in the PSB
Castilleja litoralis	Oregon coast paintbrush	None	None	G3	S3	2B.2	Coastal bluff scrub | Coastal dunes | Coastal scrub	**No Potential.** The PSB is outside of this species' elevation range (50 – 330 feet).
Chloropyron maritimum ssp. Palustre	Point Reyes salty bird's-beak	None	None	G4?T2	S2	1B.2	Marsh & swamp | Salt marsh | Wetland	**No Potential.** This species was historically observed within three miles northeast of the PSB (CDFW 2022b). Suitable habitat, consisting of coastal salt marsh wetlands, is not present within the PSB.
Chrysosplenium glechomifolium	Pacific golden saxifrage	None	None	G5?	S3	4.3	North Coast coniferous forest | Riparian forest | Roadsides (sometimes) | Seeps (sometimes) | Streambanks	**No Potential.** The PSB is outside of the elevational range for this species (35 -720 feet).
Clarkia amoena ssp. whitneyi	Whitney's farewell-to-spring	None	None	G5T1	S1	1B.1	Coastal bluff scrub | Coastal scrub	**No Potential.** There is no suitable habitat in the PSB.
Downingia willamettensis	Cascade downingia	None	None	G4	S2	2B.2	Cismontane woodland | Valley & foothill grassland | Vernal pool	**No Potential.** The PSB is outside of this species' elevation range (50 – 3,640 feet).
Erysimum menziesii	Menzies' wallflower	FE	SE	G1	S1	1B.1	Coastal dunes	**No Potential.** There is no suitable habitat in the PSB.
Erythronium oregonum	giant fawn lily	None	None	G4G5	S2	2B.2	Cismontane woodland | Meadow & seep | Ultramafic	**No Potential.** The PSB is outside of this species' elevation range (330 – 3,775 feet).
Erythronium revolutum	coast fawn lily	None	None	G4G5	S3	2B.2	Bog & fen | Broadleaved upland forest | North coast coniferous forest | Wetland	**Low Potential.** Wetland habitat is present within the PSB; however, this species is more associated with broadleaf and coniferous forests.

Scientific Name	Common Name	FESA	CESA	Global Rank[2]	State Rank[2]	CRPR[2]	Habitat Requirements[1]	Potential to Occur in the PSB
Fissidens pauperculus	minute pocket moss	None	None	G3?	S2	1B.2	North coast coniferous forest | Redwood	**No Potential.** There is no suitable habitat in the PSB.
Gilia capitata ssp. pacifica	Pacific gilia	None	None	G5T3	S2	1B.2	Chaparral | Coastal bluff scrub | Coastal prairie | Valley & foothill grassland	**Low Potential.** This species was observed within five miles of the PSB in 1937 (CDFW 2022b). Grazed grassland is present within the PSB.
Gilia millefoliata	dark-eyed gilia	None	None	G2	S2	1B.2	Coastal dunes	**No Potential.** There is no suitable habitat in the PSB.
Glehnia littoralis ssp. *leiocarpa*	American glehnia	None	None	G5T5	S2S3	4.2	Coastal dunes	**No Potential.** No suitable habitat is present in the PSB.
Hemizonia congesta ssp. *tracyi*	Tracy's tarplant	None	None	G5T4	S4	4.3	Coastal prairie | Lower montane coniferous forest | North Coast coniferous forest |Openings | Serpentinite (sometimes)	**No Potential.** The PSB is outside of this species' elevation range (395 – 3,935 feet).
Hesperevax sparsiflora var. brevifolia	short-leaved evax	None	None	G4T3	S3	1B.2	Coastal bluff scrub | Coastal dunes | Coastal prairie	**No Potential.** No suitable habitat is present in the PSB.
Hosackia gracilis	harlequin lotus	None	None	G3G4	S3	4.2	Broadleafed upland forest | Cismontane woodland | Closed-cone & North Coast coniferous forest | Coastal bluff scrub/prairie/scrub | Marshes, swamps, meadows & seeps | Valley & foothill grassland | Roadsides	**Moderate Potential.** This species is found in a variety of habitats including roadsides which are present in the PSB. This species is not mapped by CNDDB.
Lathyrus glandulosus	sticky pea	None	None	G3	S3	4.3	Cismontane woodland	**No Potential.** The PSB is outside of this species' elevation range (985 – 2,625 feet).

Scientific Name	Common Name	FESA	CESA	Global Rank[2]	State Rank[2]	CRPR[2]	Habitat Requirements[1]	Potential to Occur in the PSB
Layia carnosa	beach layia	FE	SE	G2	S2	1B.1	Coastal dunes | Coastal scrub	**No Potential.** There is no suitable habitat in the PSB.
Lilium occidentale	western lily	FE	SE	G1	S1	1B.1	Bog & fen | Coastal bluff scrub | Coastal prairie | Coastal scrub | Freshwater marsh | Marsh & swamp | North coast coniferous forest | Wetland	**No Potential.** Wetland habitat is present within the PSB; however, this species is more associated with the coast and coniferous forests.
Lilium rubescens	redwood lily	None	None	G3	S3	4.2	Broadleafed upland forest | Chaparral | Lower montane, Upper montane & North Coast coniferous forest | Roadsides (sometimes) | Serpentinite (sometimes)	**No Potential.** The PSB is outside of this species' elevation range (100 – 6,265 feet).
Listera cordata	heart-leaved twayblade	None	None	G5	S4	4.2	Bogs & fens | Lower montane coniferous forest | North Coast coniferous forest	**No Potential.** No suitable habitat is present in the PSB.
Lycopodium clavatum	running-pine	None	None	G5	S3	4.1	Lower montane coniferous forest | Marshes & swamps | North Coast coniferous forest	**No Potential.** The PSB is outside of this species' elevation range (150 – 4,020 feet).
Mitellastra caulescens	leafy-stemmed mitrewort	None	None	G5	S4	4.2	Broadleafed upland forest | Lower montane coniferous forest | Meadows & seeps | North Coast coniferous forest	**No Potential.** No suitable habitat is present in the PSB.
Montia howellii	Howell's montia	None	None	G3G4	S2	2B.2	Meadow & seep | North coast coniferous forest | Vernal pool | Wetland	**Moderate Potential.** This species was observed within two miles south of the PSB in 2018 (CDFW 2022b). Meadows and wetlands occur within and adjacent to the PSB. This species is also found along roadsides which are present in the PSB.
Oenothera wolfii	Wolf's evening-primrose	None	None	G2	S1	1B.1	Coastal bluff scrub | Coastal dunes | Coastal prairie	**No Potential.** No suitable habitat is present in or adjacent to the PSB.

Scientific Name	Common Name	FESA	CESA	Global Rank[2]	State Rank[2]	CRPR[2]	Habitat Requirements[1]	Potential to Occur in the PSB
Packera bolanderi var. bolanderi	seacoast ragwort	None	None	G4T4	S2S3	2B.2	Coastal scrub | North coast coniferous forest	**No Potential.** The PSB is outside of this species' elevation range (100 – 2,135 feet).
Pityopus californicus	California pinefoot	None	None	G4G5	S4	4.2	Broadleafed upland forest | Lower montane coniferous forest | North Coast coniferous forest | Upper montane coniferous forest	**No Potential.** The PSB is outside of this species' elevation range (50 – 7,300 feet).
Pleuropogon refractus	nodding semaphore grass	None	None	G4	S4	4.2	Lower montane coniferous forest | Meadows & seeps | North Coast coniferous forest | Riparian forest	**No Potential.** No suitable habitat is present in the PSB.
Polemonium carneum	Oregon polemonium	None	None	G3G4	S2	2B.2	Coastal prairie | Coastal scrub | Lower montane coniferous forest	**No Potential.** There is no suitable habitat in the PSB.
Puccinellia pumila	dwarf alkali grass	None	None	G4?	SH	2B.2	Marsh & swamp | Wetland	**No Potential.** Suitable habitat, consisting of coastal salt wetlands, is not present within the PSB.
Ribes laxiflorum	trailing black currant	None	None	G5?	S3	4.3	North Coast coniferous forest	**No Potential.** No suitable habitat is present in the PSB.
Ribes roezlii var. amictum	hoary gooseberry	None	None	G5T4	S4	4.3	Broadleafed upland forest | Cismontane woodland | Lower montane coniferous forest | Upper montane coniferous forest	**No Potential.** The PSB is outside of this species' elevation range (395 – 7,545 feet).
Romanzoffia tracyi	Tracy's romanzoffia	None	None	G4	S2	2B.3	Coastal bluff scrub | Coastal scrub	**No Potential.** No suitable habitat is present in the PSB.
Sidalcea malachroides	maple-leaved checkerbloom	None	None	G3	S3	4.2	Broadleafed upland forest | Coastal prairie | Coastal scrub | North Coast coniferous forest | Riparian woodland	**Low Potential.** Marginally suitable habitat is present in the project footprint.

Scientific Name	Common Name	FESA	CESA	Global Rank[2]	State Rank[2]	CRPR[2]	Habitat Requirements[1]	Potential to Occur in the PSB
Sidalcea malviflora ssp. patula	Siskiyou checkerbloom	None	None	G5T2	S2	1B.2	Coastal bluff scrub | Coastal prairie | North coast coniferous forest	**No Potential.** The PSB is outside of this species' elevation range.
Sidalcea oregana ssp. eximia	coast checkerbloom	None	None	G5T1	S1	1B.2	Lower montane coniferous forest | Meadow & seep | North coast coniferous forest | Wetland	**Low Potential.** Meadows and wetlands are present within the PSB.
Sisyrinchium hitchcockii	Hitchcock's blue-eyed grass	None	None	G1G2	S1	1B.1	Cismontane woodland | Valley & foothill grassland	**No Potential.** The PSB is outside of this species' elevation range (1,000 feet).
Spergularia canadensis var. occidentalis	western sand-spurrey	None	None	G5T4	S1	2B.1	Marsh & swamp | Wetland	**No Potential.** The wetlands in the PSB are not brackish enough to support this species.
Usnea longissima	Methuselah's beard lichen	None	None	G4	S4	4.2	Broadleafed upland forest | North Coast coniferous forest	**No Potential.** The PSB is outside of this species' elevation range (165 - 4,790 feet).

Footnotes:

[1] General habitat, and microhabitat column information, reprinted from CNDDB (January 2022).

[2] Rankings from CNDDB (January 2022).

Column Header Categories and Abbreviations:

FESA Listing status under the federal Endangered Species Act (ESA)

FE Federal Endangered; FT = Federal Threatened; FC = Federal Candidate; FD = Federally Delisted

CESA Listing status under the California state Endangered Species Act (CESA)

SE State Endangered; SD = State Delisted; ST = State Threatened.

GRank: Global Rank from NatureServe's Heritage Methodology (NatureServe 2022) (ranking according to degree of global imperilment - G1 = Critically Imperiled—At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors; G2 = Imperiled—At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors; G3 = Vulnerable—At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors; G4 = Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors; G5 = Secure—Common; widespread and abundant. Subspecies/variety level: "Subspecies/varieties receive a T-rank attached to the G-rank. With the subspecies/varieties, the G-rank reflects the condition of the entire species, whereas the T-rank reflects the global situation of just the subspecies or variety" (CDFW 2022b); ? = " Denotes inexact numeric rank" (NatureServe 2021); Q = " Questionable taxonomy that may reduce conservation priority" (NatureServe 2022)

SRank: State Rank from NatureServe's Heritage Methodology (NatureServe 2022) (ranking according to degree of imperilment in the state (California) - S1 = Critically Imperiled—Critically imperiled in the state because of extreme rarity (often 5 or fewer populations) or because of factor(s) such as very steep declines making it especially vulnerable to extirpation from the state; S2 = Imperiled—Imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state; S3 = Vulnerable—Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation from the state; S4 = Apparently Secure—Uncommon but not rare in the state; some cause for long-term concern due to declines or other factors; S5 = Secure—Common, widespread, and abundant in the state; SNR = State Not Ranked.

CRPR: CNPS rankings for rare plants (CNPS 2022) - 1A = Plants presumed extinct in California; 1B = Plants rare, threatened or endangered in California and elsewhere; 2 = Plants rare, threatened, or endangered in California, but more common elsewhere; 3 = Plants about which more information is needed (a review list); 4 = Plants of limited distribution (a watch list); n/a = not applicable; Threat Code extensions and their meanings: ".1 - Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat); .2 – Moderately threatened in California (20-80% of occurrences threatened / moderate degree and immediacy of threat); .3 – Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)" (CDFW 2022b).

Potential to Occur:

No Potential: Habitat in and adjacent to the PSB is clearly unsuitable for the species requirements (cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

Low Potential: Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found in the PSB.

Moderate Potential: Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found in the PSB.

High Potential: All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on in the PSB

Present: Detected or documented on-site.

Table 4-2 Sensitive Natural Communities Potential to Occur

Habitat Type	Global Rank[2]	State Rank[2]	General Habitat Description[1]	Potential to Occur in the PSB
Sitka Spruce Forest	G1	S1.1	Forest	**No Potential.** Sitka Spruce is not present within the PSB.
Coastal Terrace Prairie	G2	S2.1	Herbaceous	**No Potential.** This SNC is typically comprised of a dense, tall grassland dominated by both sod- and tussock-forming native perennial grasses, which is adjacent to the PSB. The grasses in the PSB are predominantly annual, grazed, and mowed.
Northern Coastal Salt Marsh	G3	S3.2	Marsh	**No Potential.** Wetlands present within the PSB are freshwater.

Footnotes:

[1] General habitat information reprinted from CNDDB (January 2022).

[2] Rankings from CNDDB (January 2022).

Column Header Categories and Abbreviations:

GRank: Global Rank from NatureServe's Heritage Methodology (NatureServe 2022) (ranking according to degree of global imperilment - G1 = Critically Imperiled—At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors; G2 = Imperiled—At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors; G3 = Vulnerable—At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors; G4 = Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors; G5 = Secure—Common; widespread and abundant. Subspecies/variety level: "Subspecies/varieties receive a T-rank attached to the G-rank. With the subspecies/varieties, the G-rank reflects the condition of the entire species, whereas the T-rank reflects the global situation of just the subspecies or variety" (CDFW 2022b); ? = "Denotes inexact numeric rank" (NatureServe 2022); Q = "Questionable taxonomy that may reduce conservation priority" (NatureServe 2022)

State Rank: State Rank from NatureServe's Heritage Methodology (NatureServe 2022) (ranking according to degree of imperilment in the state (California) – S1 = Critically Imperiled—Critically imperiled in the state because of extreme rarity (often 5 or fewer populations) or because of factor(s) such as very steep declines making it especially vulnerable to extirpation from the state; S2 = Imperiled—Imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state; S3 = Vulnerable—Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation from the state.

Threat code extensions and their meanings: ".1 – Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat); .2 – Moderately threatened in California (20-80% of occurrences threatened / moderate degree and immediacy of threat); .3 – Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)" (CDFW 2022b).

4.2 Floristic Surveys

GHD Botanists Christian Hernandez and Kolby Lundgren conducted spring and summer floristic surveys for special status plants according to *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 surveys were 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 Christian Hernandez has a B.S. in Ecological Restoration from Humboldt State University and has two years of experience conducting biological and botanical surveys. GHD Botanist Kolby Lundgren has

a B.S. in Botany from Humboldt State University and over six years of experience conducting biological and botanical surveys in Northern California.

The GHD Botanists conducted botanical surveys on April 05 and June 28, 2022 and the entire 6.53-acre PSB was surveyed with survey efforts totaling 10.5 hours total. During the spring survey, the weather was sunny and approximately 55 degrees Fahrenheit. During the summer survey the weather was sunny and approximately 70 degrees Fahrenheit. A list of species observed within the PSB is provided (**Appendix C**). Representative photos were captured of select habitats onsite (**Appendix D**).

4.3 Vegetation Mapping and Assessment

Vegetation communities onsite with species typical of SNCs 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. Vegetation Rapid Assessments were conducted according to protocol (CDFW 2018, CDFW-CNPS 2019), and Vegetation Rapid Assessment forms (**Appendix E**) were used to characterize dominant vegetation and evaluate habitat quality. These Vegetation Rapid Assessments provided the basis for potential SNC designation. Photo documentation of habitats observed onsite can be found in **Appendix D**, and a soil map can be found in the Custom Soil Resource Report in **Appendix F**. Vegetation communities were mapped using points collected in the field with an Eos Arrow 100 Submeter GPS Receiver with 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.

5. Results

A stand of planted Monterey pine (*Pinus radiata*) which is both a rare plant and an SNC in its native habitat was observed within the PSB; however, this stand of trees was planted outside of its native habitat and therefore is not considered rare or sensitive (**Appendix A, Figure 3**). No special status plants were observed in the PSB.

5.1 Sensitive Natural Community Assessment

As mentioned, the PSB contains a stand of planted Monterey pine at the junction of Van Ness Avenue and 5th Street, however this landscaped area is not a naturally occurring community and is not ranked as an alliance in *A Manual of California Vegetation*. Please see **Appendix E** Rapid Assessment data form for FERD001 for additional details and **Appendix A, Figure 3** for location.

6. Conclusions

This report documents the results of seasonally appropriate surveys for special status plant species and SNCs in the PSB according to *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018). No special status plant species or SNC were observed in the PSB and no additional rare plant surveys are needed for the Project. A wetland delineation has been completed, and the location and extent of wetlands onsite is documented separately in the Aquatic Resources Delineation Report (GHD 2022). Additional pre-construction surveys and on-site impact/mitigation evaluation may be warranted if it is determined that the Project has the potential to impact special status plants.

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8. Report Preparers

8.1 Client

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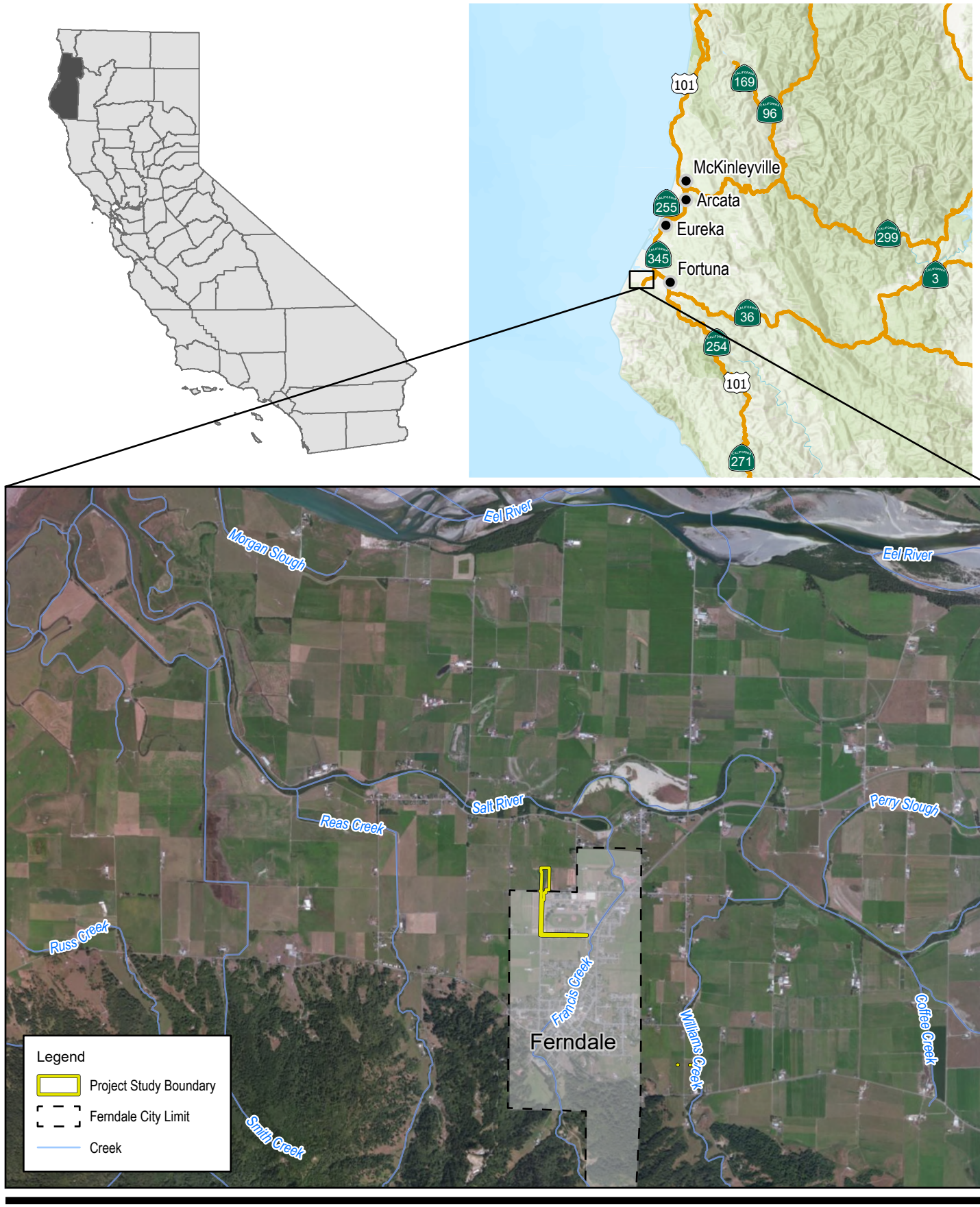
Appendices

Appendix A

Figures



Paper Size ANSI A

0 1,000 2,000 3,000 4,000

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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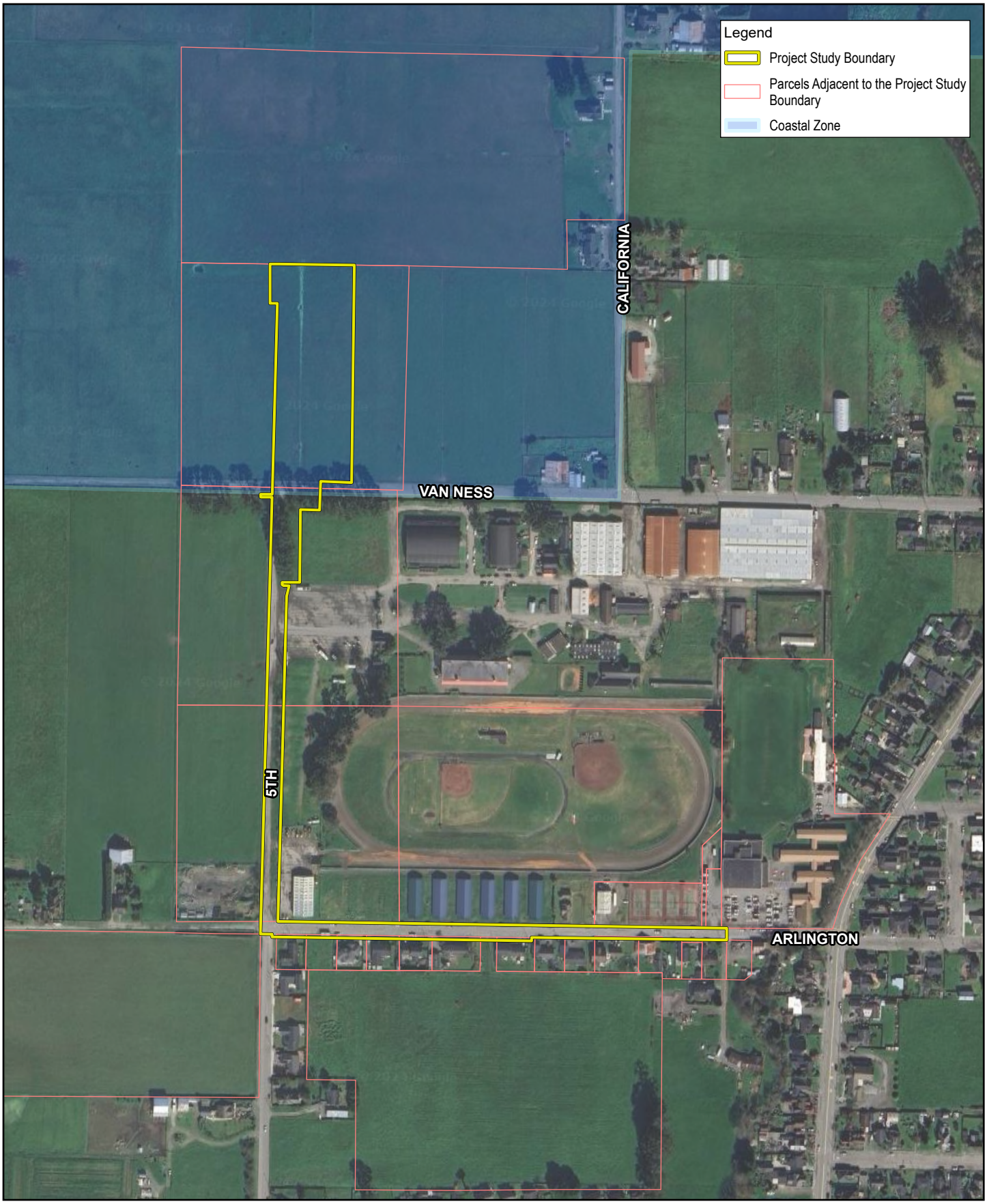
GHD

City of Ferndale
Ferndale Drainage Project

Project No. **12638533**
Revision No. **-**
Date **Oct 2024**

Project Vicinity

FIGURE 1



Paper Size ANSI A

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Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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GHD

City of Ferndale
Ferndale Drainage Project

Project No. **12638533**
Revision No. **-**
Date **Oct 2024**

Project Area

FIGURE 2

N:\US\Azure\EastUS\12638533\GIS\Maps\Deliverables\12638533_AquaticResourceDelineationRPT.aprx
Print date: 30 Oct 2024 - 11:50

Data source: Humboldt County, Google Maps Sat; © OpenStreetMap (and) contributors, CC-BY-SA. Created by: mhargrave

Paper Size ANSI A

0 25 50 75 100

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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GHD

City of Ferndale
Ferndale Drainage Project

Project No. **12638533**
Revision No. **-**
Date **Oct 2024**

Vegetation Association

FIGURE 3

N:\US\Azure\EastUS\12638533\GIS\Maps\Deliverables\12638533_BotanicalRPT\12638533_BotanicalRPT\12638533_BotanicalRPT.aprx - 12638533_VegetationAssn
Print date: 30 Oct 2024 - 12:26

Data source: GHD 2022.06.28, Humboldt County, Google Maps Sat; © OpenStreetMap (and) contributors, CC-BY-SA. Created by: mhargrave

Appendix B

Database Query Results

CNPS & CNDDB 6 quad Search: Ferndale, Capetown, Taylor Peak, Fortuna, Fields Landing, Cannibal Island. Jan, 18, 2022

ScientificName	CommonName	Family	Lifeform	CRPR	GRank	SRank	CESA	FESA	Blooming	Habitat
Abronia umbellata var. breviflora	pink sand-verbena	Nyctaginaceae	perennial herb	1B.1	G4G5T2	S2	None	None	Jun-Oct	Coastal dunes
Angelica lucida	sea-watch	Apiaceae	perennial herb	4.2	G5	S3	None	None	Apr-Sep	Coastal bluff scrub, Coastal dunes, Coastal scrub, Marshes and swamps
Anomobryum julaceum	slender silver moss	Bryaceae	moss	4.2	G5?	S2	None	None		Broadleafed upland forest, Lower montane coniferous forest, North Coast coniferous forest
Astragalus pycnostachyus var. pycnostachyus	coastal marsh milk-vetch	Fabaceae	perennial herb	1B.2	G2T2	S2	None	None	(Apr)Jun-O	Coastal dunes, Coastal scrub, Marshes and swamps
Calamagrostis foliosa	leafy reed grass	Poaceae	perennial herb	4.2	G3	S3	CR	None	May-Sep	Coastal bluff scrub, North Coast coniferous forest; rocky soils
Carex leptalea	bristle-stalked sedge	Cyperaceae	perennial, rhizomatous	2B.2	G5	S1	None	None	Mar-Jul	Bogs and fens, Marshes and swamps, Meadows and seeps
Carex lyngbyei	Lyngbye's sedge	Cyperaceae	perennial, rhizomatous	2B.2	G5	S3	None	None	Apr-Aug	Marshes and swamps
Castilleja ambigua var. humboldtiensis	Humboldt Bay owl's-clover	Orobanchaceae	annual herb (hemiparasite)	1B.2	G4T2	S2	None	None	Apr-Aug	Marshes and swamps
Castilleja litoralis	Oregon coast paintbrush	Orobanchaceae	perennial herb	2B.2	G3	S3	None	None	Jun	Coastal bluff scrub, Coastal dunes, Coastal scrub; sandy soils
Chloropyron maritimum ssp. palustre	Point Reyes salty bird's-beak	Orobanchaceae	annual herb (hemiparasite)	1B.2	G4?T2	S2	None	None	Jun-Oct	Marshes and swamps
Chrysosplenium glechomifolium	Pacific golden saxifrage	Saxifragaceae	perennial herb	4.3	G5?	S3	None	None	Feb-Jun	North Coast coniferous forest, Riparian forest; Roadsides (sometimes), Seeps (sometimes), Streambanks
Clarkia amoena ssp. whitneyi	Whitney's farewell- to-spring	Onagraceae	annual herb	1B.1	G5T1	S1	None	None	Jun-Aug	Coastal bluff scrub, Coastal scrub
Downingia willamettensis	Cascade downingia	Campanulaceae	annual herb	2B.2	G4	S2	None	None	Jun-Jul(Se	Cismontane woodland, Valley and foothill grassland, Vernal pools
Erysimum menziesii	Menzies' wallflower	Brassicaceae	perennial herb	1B.1	G1	S1	CE	FE	Mar-Sep	Coastal dunes

ScientificName	CommonName	Family	Lifeform	CRPR	GRank	SRank	CESA	FESA	Blooming	Habitat
Erythronium oregonum	giant fawn lily	Liliaceae	perennial herb	2B.2	G4G5	S2	None	None	Mar-Jun(Ju	Cismontane woodland, Meadows and seeps; Openings, Rocky, Serpentinite (sometimes)
Erythronium revolutum	coast fawn lily	Liliaceae	perennial, bulbiferous	2B.2	G4G5	S3	None	None	Mar-Jul(Au	Bogs and fens, Broadleafed upland forest, North Coastconiferous forest; mesic streambanks
Fissidens pauperculus	minute pocket moss	Fissidentaceae	moss	1B.2	G3?	S2	None	None		North Coast coniferous forest
Gilia capitata ssp. pacifica	Pacific gilia	Polemoniaceae	annual herb	1B.2	G5T3	S2	None	None	Apr-Aug	Chaparral, Coastal bluff scrub, Coastal prairie, Valley and foothill grassland
Gilia millefoliata	dark-eyed gilia	Polemoniaceae	annual herb	1B.2	G2	S2	None	None	Apr-Jul	Coastal dunes
Glehnia littoralis ssp. leiocarpa	American glehnia	Apiaceae	perennial herb	4.2	G5T5	S2S3	None	None	May-Aug	Coastal dunes
Hemizonia congesta ssp. tracyi	Tracy's tarplant	Asteraceae	annual herb	4.3	G5T4	S4	None	None	(Mar)May-	Coastal prairie, Lower montane coniferous forest, North Coast coniferous forest; Openings, Serpentinite (sometimes)
Hesperevax sparsiflora var. brevifolia	short-leaved evax	Asteraceae	annual herb	1B.2	G4T3	S3	None	None	Mar-Jun	Coastal bluff scrub, Coastal dunes, Coastal prairie
Hosackia gracilis	harlequin lotus	Fabaceae	perennial, rhizomatous	4.2	G3G4	S3	None	None	Mar-Jul	Broadleafed upland forest, Cismontane woodland, Closed- cone coniferous forest, Coastal bluff scrub, Coastal prairie, Coastal scrub, Marshes and swamps, Meadows and seeps, North Coast coniferous forest, Valley and foothill grassland; Roadsides
Lathyrus glandulosus	sticky pea	Fabaceae	perennial, rhizomatous	4.3	G3	S3	None	None	Apr-Jun	Cismontane woodland
Layia carnosa	beach layia	Asteraceae	annual herb	1B.1	G2	S2	CE	FE	Mar-Jul	Coastal dunes, Coastal scrub
Lilium occidentale	western lily	Liliaceae	perennial, bulbiferous	1B.1	G1	S1	CE	FE	Jun-Jul	Bogs and fens, Coastal bluff scrub, Coastal prairie, Coastal scrub, Marshes and swamps, North Coast coniferous forest

ScientificName	CommonName	Family	Lifeform	CRPR	GRank	SRank	CESA	FESA	Blooming	Habitat
Lilium rubescens	redwood lily	Liliaceae	perennial, bulbiferous	4.2	G3	S3	None	None	Apr-Aug(S	Broadleafed upland forest, Chaparral, Lower montane coniferous forest, North Coast coniferous forest, Upper montane coniferous forest; Roadsides (sometimes), Serpentinite (sometimes)
Listera cordata	heart-leaved twayblade	Orchidaceae	perennial herb	4.2	G5	S4	None	None	Feb-Jul	Bogs and fens, Lower montane coniferous forest, North Coast coniferous forest
Lycopodium clavatum	running-pine	Lycopodiaceae	perennial, rhizomatous	4.1	G5	S3	None	None	Jun-Aug(S	Lower montane coniferous forest, Marshes and swamps, North Coast coniferous forest
Mitellastra caulescens	leafy-stemmed mitrewort	Saxifragaceae	perennial, rhizomatous	4.2	G5	S4	None	None	(Mar)Apr-O	Broadleafed upland forest, Lower montane coniferous forest, Meadows and seeps, North Coast coniferous forest
Montia howellii	Howell's montia	Montiaceae	annual herb	2B.2	G3G4	S2	None	None	(Feb)Mar-M	Meadows and seeps, North Coast coniferous forest, Vernal pools
Oenothera wolfii	Wolf's evening-primrose	Onagraceae	perennial herb	1B.1	G2	S1	None	None	May-Oct	Coastal bluff scrub, Coastal dunes, Coastal prairie, Lower montane coniferous forest
Packera bolanderi var. bolanderi	seacoast ragwort	Asteraceae	perennial, rhizomatous	2B.2	G4T4	S2S3	None	None	(Jan-Apr)M	Coastal scrub, North Coast coniferous forest
Pityopus californicus	California pinefoot	Ericaceae	perennial herb	4.2	G4G5	S4	None	None	(Mar-Apr)M	Broadleafed upland forest, Lower montane coniferous forest, North Coast coniferous forest, Upper montane coniferous forest
Pleuropogon refractus	nodding semaphore grass	Poaceae	perennial, rhizomatous	4.2	G4	S4	None	None	(Mar)Apr-A	Lower montane coniferous forest, Meadows and seeps, North Coast coniferous forest, Riparian forest
Polemonium carneum	Oregon polemonium	Polemoniaceae	perennial herb	2B.2	G3G4	S2	None	None	Apr-Sep	Coastal prairie, Coastal scrub, Lower montane coniferous forest

ScientificName	CommonName	Family	Lifeform	CRPR	GRank	SRank	CESA	FESA	Blooming	Habitat
Puccinellia pumila	dwarf alkali grass	Poaceae	perennial herb	2B.2	G4?	SH	None	None	Jul	Marshes and swamps
Ribes laxiflorum	trailing black currant	Grossulariaceae	perennial, deciduous	4.3	G5?	S3	None	None	Mar-Jul(Au	North Coast coniferous forest
Ribes roezlii var. amictum	hoary gooseberry	Grossulariaceae	perennial, deciduous	4.3	G5T4	S4	None	None	Mar-Apr	Broadleafed upland forest, Cismontane woodland, Lower montane coniferous forest, Upper montane coniferous forest
Romanzoffia tracyi	Tracy's romanzoffia	Hydrophyllaceae	perennial herb	2B.3	G4	S2	None	None	Mar-May	Coastal bluff scrub, Coastal scrub
Sidalcea malachroides	maple-leaved checkerbloom	Malvaceae	perennial herb	4.2	G3	S3	None	None	(Mar)Apr-A	Broadleafed upland forest, Coastal prairie, Coastal scrub, North Coast coniferous forest, Riparian woodland
Sidalcea malviflora ssp. patula	Siskiyou checkerbloom	Malvaceae	perennial, rhizomatous	1B.2	G5T2	S2	None	None	(Mar)May-	Coastal bluff scrub, Coastal prairie, North Coast coniferousforest
Sidalcea oregana ssp. eximia	coast checkerbloom	Malvaceae	perennial herb	1B.2	G5T1	S1	None	None	Jun-Aug	Lower montane coniferous forest, Meadows and seeps, North Coast coniferous forest
Sisyrinchium hitchcockii	Hitchcock's blue-eyed grass	Iridaceae	perennial, rhizomatous	1B.1	G1G2	S1	None	None	Jun	Cismontane woodland, Valley and foothill grassland
Spergularia canadensis var. occidentalis	western sand-spurrey	Caryophyllaceae	annual herb	2B.1	G5T4	S1	None	None	Jun-Aug	Marshes and swamps
Usnea longissima	Methuselah's beard li	Parmeliaceae	fruticose lichen	4.2	G4	S4	None	None		Broadleafed upland forest, North Coast coniferous forest

Appendix C

Plant Species Observed within PSB

Appendix C. Plant Species Observed within the PSB

Scientific Name	Common Name	Status	Form	Date
Achillea millefolium	Yarrow	native	Perennial herb	4/5/2022
Agrostis stolonifera	Redtop	invasive non-native	Perennial grass	4/5/2022
Allium triquetrum	White flowered onion	non-native	Perennial herb (bulb)	4/5/2022
Anthoxanthum odoratum	Sweet vernal grass	invasive non-native	Annual, Perennial grass	4/5/2022
Arabidopsis thaliana	Arabidopsis	non-native	Annual herb	4/5/2022
Athyrium felix femina	Lady fern	native	Fern	6/28/2022
Avena barbata	Slim oat	invasive non-native	Annual grass	4/5/2022
Bellis perennis	English lawn daisy	non-native	Perennial herb	4/5/2022
Brassica rapa	Common mustard	invasive non-native	Annual herb	4/5/2022
Briza maxima	Rattlesnake grass	non-native	Annual grass	6/28/2022
Bromus diandrus	Ripgut brome	invasive non-native	Annual grass	4/5/2022
Carex hassei	Hasse's sedge	native	Perennial grass	4/5/2022
Carex nudata	Torrent sedge	native	Perennial grass	4/5/2022
Cirsium vulgare	Bullthistle	invasive non-native	Perennial herb	4/5/2022
Cortaderia selloana	Pampas grass	invasive non-native	Perennial grass	4/5/2022
Dactylis glomerata	Orchardgrass	non-native	Annual herb	6/28/2022
Epilobium ciliatum	Willowherb	native	Perennial herb	6/28/2022
Equisetum telmateia	Giant horsetail	native	Fern	4/5/2022
Erodium moschatum	Whitestem filaree	non-native	Annual herb	4/5/2022
Euphorbia peplus	Petty spurge	non-native	Annual herb	4/5/2022
Festuca arundinacea	Reed fescue	invasive non-native	Perennial grass	4/5/2022
Festuca bromoides	Brome fescue	non-native	Annual grass	4/5/2022
Festuca myuros	Rattail sixweeks grass	invasive non-native	Annual grass	4/5/2022
Festuca perennis	Italian rye grass	non-native	Annual herb	6/28/2022
Geranium dissectum	Wild geranium	invasive non-native	Annual herb	4/5/2022
Hedera helix	English ivy	invasive non-native	Vine, Shrub	4/5/2022
Holcus lanatus	Common velvetgrass	invasive non-native	Perennial grass	4/5/2022
Hypochaeris radicata	Hairy cats ear	invasive non-native	Perennial herb	4/5/2022
Ilex aquifolium	Holly	invasive non-native	Tree, Shrub	4/5/2022
Juncus effuses	Common rush	native	Perennial grass	6/28/2022
Lemna spp.				4/5/2022
Leontodon saxatilis	Hawkbit	non-native	Annual herb	4/5/2022
Malva parviflora	Cheeseweed	non-native	Annual herb	4/5/2022
Nasturtium officinale	Watercress	native	Perennial herb (aquatic)	4/5/2022
Oenanthe sarmentosa	Water parsley	native	Perennial herb	6/28/2022
Pinus radiata	Monterey pine	native	Tree	4/5/2022
Plantago lanceolata	Ribwort	invasive non-native	Perennial herb	4/5/2022
Poa annua	Annual blue grass	non-native	Annual grass	4/5/2022
Poa pratensis	Kentucky blue grass	invasive non-native	Perennial grass	4/5/2022
Prunella vulgaris	Self heal	native	Perennial herb	4/5/2022
Prunus spp.				4/5/2022
Ranunculus repens	Creeping buttercup	invasive non-native	Perennial herb	4/5/2022

Scientific Name	Common Name	Status	Form	Date
Rosa nutkana	Nootka rose	native	Shrub	6/28/2022
Rubus armeniacus	Himalayan blackberry	non-native	Shrub	6/28/2022
Rubus ursinus	California blackberry	native	Vine, Shrub	4/5/2022
Rumex acetosella	Sheep sorrel	invasive non-native	Perennial herb	4/5/2022
Rumex obtusifolius	Broadleaf dock	non-native	Perennial herb	4/5/2022
Sagina procumbens	Arctic pearlwort	native	Perennial herb	4/5/2022
Scirpus microcarpus	Small fruited bullrush	native	Perennial grass	6/28/2022
Senecio vulgaris	Common groundsel	non-native	Annual herb	4/5/2022
Soleirolia soleirolii	Baby's tears	non-native	Annual herb	6/28/2022
Soliva sessilis	South american soliva	non-native	Annual herb	4/5/2022
Sonchus oleraceus	Sow thistle	non-native	Annual herb	4/5/2022
Stachys ajugoides	Hedge nettle	native	Perennial herb	6/28/2022
Trifolium repens	White clover	non-native	Perennial herb	4/5/2022
Trifolium spp.				4/5/2022
Vicia sativa	Spring vetch	non-native	Annual herb, Vine	4/5/2022

Appendix D

PSB Photographs

Photo 1: Planted stand of Monterey pine (*Pinus radiata*) at the corner of 5th Street and Van Ness Avenue. Looking north towards pasture.

Photo 2: Drainage ditch running parallel to 5th Street on east side, adjacent to planted stand of Monterey pine.

Photo 3: Pasture on north side of Van Ness Avenue, utilized for grazing.

Appendix E

Vegetation Rapid Assessment Forms

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: Christian Hernandez
FERD001	4/5/22	Other surveyors:
	UID:	Location Name: Ferndale Drainage

GPS name: Arrow 8 — 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) ____ bearing ° ____ inclination ° ____

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

Camera Name: Cardinal photos at ID point:

Other photos:

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

Exposure, Actual °: 260 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: 5 BA Stems: 9 Litter: 2 Bedrock: 0 Boulder: 0 Stone: 0 Cobble: 1 Gravel: 1 Fines: 82 =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 North 5th street by Van Ness Ave. Monterey pine with drainage ditch.

Disturbance code / Intensity (L,M,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: Monterey pine stand

Field-assessed Association name (optional): _____

Adjacent Alliances/direction: _____/_____, _____/_____

Confidence in Alliance identification: (H) M L Explain: Planted as windbreaks in coastal areas

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

Combined Vegetation Rapid Assessment and Relevé Field Form

(Revised March 27, 2018)

SPECIES SHEET

Database #: FERD 001

IV. VEGETATION DESCRIPTION

% NonVasc cover: 57 **Total % Vasc Veg cover:** 43

% Cover - **Conifer tree / Hardwood tree:** 40 / — **Regenerating Tree:** — **Shrub:** — **Herbaceous:** 39

Height Class - Conifer tree / Hardwood tree: 8 / — **Regenerating Tree:** — **Shrub:** — **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	40		
H	Nasturtium officinale	2		
H	Vicia sativa	2		
H	Carex nudata	2		
H	Lemna sp.	9		
H	Hedera helix	2		
H	Festuca sp.	10		
H	Anthoxanthum odoratum	12		

Unusual species: _____

Appendix F

NRCS Custom Soil Resources Report

United States Department of Agriculture

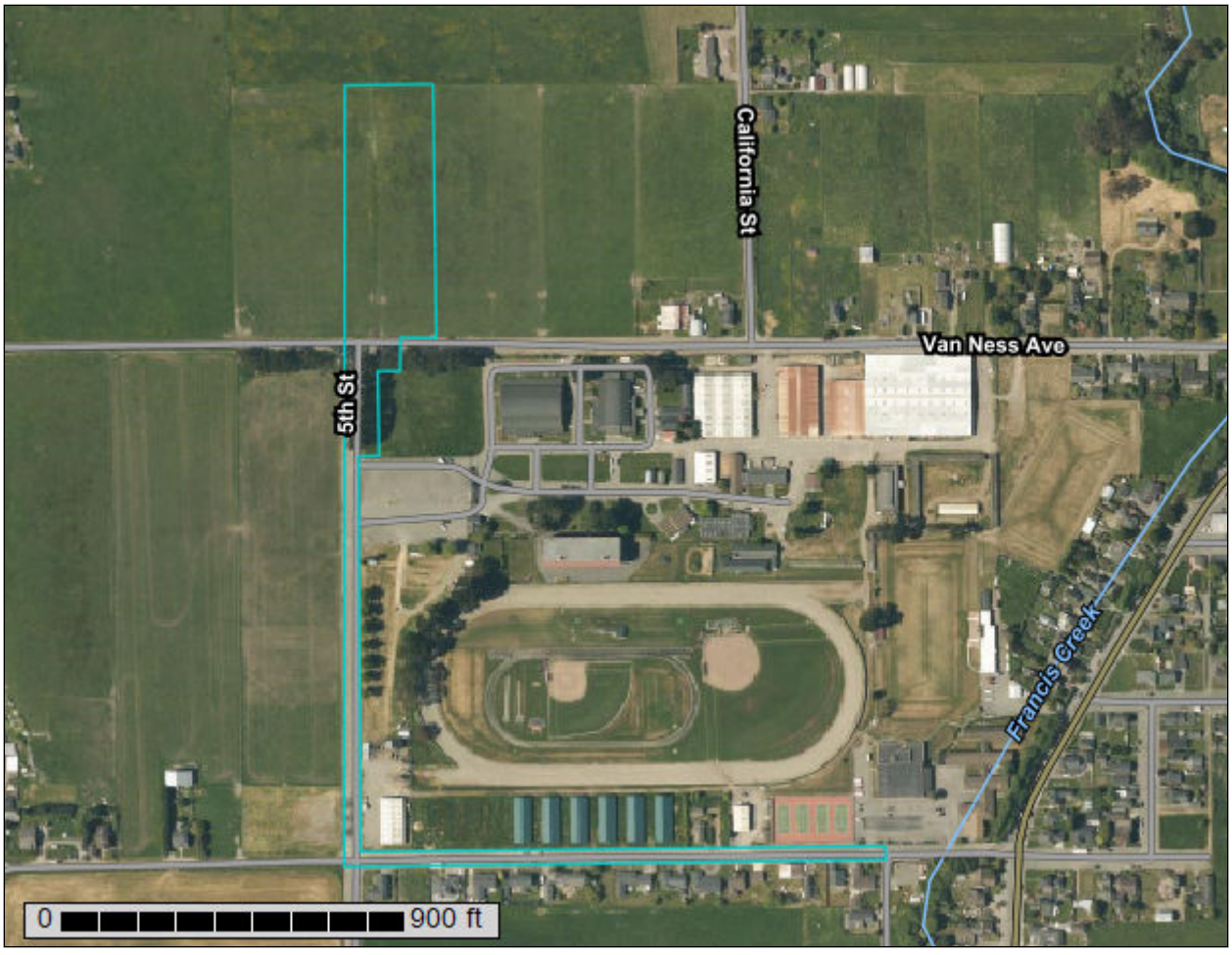
NRCS

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

12561178 City of Ferndale Proposition 1 Technical Assistance



February 22, 2022

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.

Map Scale: 1:3,650 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 150 300 600 900

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 7, Sep 6, 2021

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 (Ferndale Drainage Project)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
110	Weott, 0 to 2 percent slopes	3.8	58.7%
116	Swainslough, 0 to 2 percent slopes	2.7	41.3%
Totals for Area of Interest		**6.5**	**100.0%**

Map Unit Descriptions (Ferndale Drainage Project)

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

110—Weott, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hs3l
Elevation: 0 to 150 feet
Mean annual precipitation: 35 to 80 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 275 to 330 days
Farmland classification: Prime farmland if irrigated and drained

Map Unit Composition

Weott and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Weott

Setting

Landform: Backswamps, depressions, flood-plain steps
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Alluvium derived from mixed sources

Typical profile

Ap - 0 to 12 inches: silt loam
Bg1 - 12 to 26 inches: silt loam
Bg2 - 26 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 0 to 4 inches
Frequency of flooding: NoneOccasional
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): 5w
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: R004BA205CA - Marshlands
Hydric soil rating: Yes

Minor Components

Worswick

Percent of map unit: 5 percent
Landform: Natural levees, flood-plain steps

Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Swainslough

Percent of map unit: 4 percent
Landform: Backswamps, depressions, flood-plain steps, salt marshes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

Arlynda

Percent of map unit: 3 percent
Landform: Meander scars, backswamps, depressions, flood-plain steps
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

Ferndale

Percent of map unit: 3 percent
Landform: Flood-plain steps
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

116—Swainslough, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hs3n
Elevation: 0 to 160 feet
Mean annual precipitation: 35 to 80 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 275 to 330 days
Farmland classification: Not prime farmland

Map Unit Composition

Swainslough and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Swainslough

Setting

Landform: Salt marshes, backswamps, depressions, flood-plain steps
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Alluvium derived from mixed sources

Typical profile

Oi - 0 to 3 inches: slightly decomposed plant material
A - 3 to 12 inches: silty clay loam
Bg1 - 12 to 20 inches: silty clay loam
Bg2 - 20 to 29 inches: silty clay loam
Bg3 - 29 to 38 inches: silty clay loam
Bg4 - 38 to 65 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 0 to 4 inches
Frequency of flooding: NoneOccasional
Frequency of ponding: Frequent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): 5w
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Ecological site: R004BA205CA - Marshlands
Hydric soil rating: Yes

Minor Components

Wigi, occasionally flooded

Percent of map unit: 4 percent
Landform: Salt marshes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Arlynda

Percent of map unit: 3 percent
Landform: Meander scars, backswamps, depressions, flood-plain steps
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

Weott

Percent of map unit: 2 percent
Landform: Backswamps, depressions, flood-plain steps
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

Loleta

Percent of map unit: 1 percent
Landform: Alluvial fans, fan remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: Yes

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