

APPENDIX G

Biological Resources: *Humboldt Wind Energy Project Botanical Resources Report, Humboldt County, California, Spring and Summer 2018*



Humboldt Wind Energy Project
Botanical Resources Report

October 30, 2018

Prepared for:

Humboldt Wind, LLC
11455 El Camino Real, Suite 160
San Diego, CA 92130

Prepared by:

Stantec Consulting Services Inc.
1383 North McDowell Boulevard, Suite 250
Petaluma, CA 94954-7118

Table of Contents

ACRONYMS AND ABBREVIATIONS	1
1.0 INTRODUCTION.....	1
2.0 ENVIRONMENTAL SETTING	2
3.0 METHODS	4
3.1 DATABASE AND LITERATURE REVIEW	4
3.2 FIELD SURVEYS.....	5
3.2.1 Vegetation Mapping.....	5
3.2.2 Botanical Resources.....	6
4.0 RESULTS AND DISCUSSION	8
4.1 VEGETATION COMMUNITIES	8
4.1.1 Forests and Woodlands.....	13
4.1.2 Shrublands	16
4.1.3 Herbaceous Vegetation	18
4.1.4 Other.....	23
4.2 SPECIAL-STATUS SPECIES	23
4.2.1 Pacific Gilia.....	24
4.2.2 Short-Leaved Evax.....	24
4.2.3 Howell's Montia.....	24
4.2.4 Siskiyou Checkerbloom	25
4.3 CRPR 3 OR 4 PLANT SPECIES	25
4.3.1 Methuselah's Beard Lichen	26
4.3.2 Pacific Golden Saxifrage	26
4.3.3 Tracy's Tarplant.....	27
4.3.4 Redwood Lily	27
4.3.5 Heart-Leaved Twayblade	27
4.3.6 Running-Pine.....	27
4.3.7 Leafy-Stemmed Mitrewort	28
4.3.8 California Pinefoot	28
4.3.9 Nodding Semaphore Grass	28
4.3.10 Hoary Gooseberry	28
4.3.11 Maple-Leaved Checkerbloom.....	28
4.4 INVASIVE SPECIES	29
5.0 REFERENCES.....	31

LIST OF TABLES

Table 1. Soil Mapunits Within the Project Area.....	2
Table 2. Humboldt Wind Energy Project Botanical Survey Dates in 2018.....	8
Table 3. Vegetation Communities in the Project Area	9
Table 4. Special-Status Plant Species Identified in the Humboldt Wind Energy Project During 2018 Botanical Surveys.....	23

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

Table 5. California Rare Plant Rank 3 or 4 Plant Species Identified in the Humboldt Wind Energy Project During 2018 Botanical Surveys25

LIST OF FIGURES

- Figure 1. General Overview Map
- Figure 2. Botanical Resources Survey Areas
- Figure 3. Soils Map
- Figure 4. Vegetation Communities
- Figure 5. Botanical Resources Survey Results Map

LIST OF APPENDICES

- APPENDIX A PLANT SPECIES EVALUATED
- APPENDIX B PLANT SPECIES OBSERVED
- APPENDIX C REPRESENTATIVE PHOTOGRAPHS OF SPECIAL-STATUS AND CRPR 3 OR 4 PLANT SPECIES

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

Acronyms and Abbreviations

% RC	percent relative cover
ac	acre/acres
Cal-IPC	California Invasive Plant Council
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
ESA	Endangered Species Act
ft	foot/feet
gen-tie	generation transmission line
HRC	Humboldt Redwood Company
MCV	A Manual of California Vegetation, 2nd Edition
mi	mile/miles
USFWS	U.S. Fish and Wildlife Service

Note:

Often, agency suggestions and guidelines are provided in US units of measure (e.g., acres [ac] feet [ft], or miles [mi]), and in other instances, agency guidance is provided in metric (aka SI, or System International) units (e.g., meters [m] or kilometers [km]). To convert an otherwise readily recognized agency standard (e.g., 10 mi or 1 km) to the other system may result in confusion. Accordingly, measures are provided in either system, using the original agency suggestion unchanged, and provide conversion to the other standard only when it makes sense to do so.

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

1.0 INTRODUCTION

Humboldt Wind, LLC (Humboldt Wind) is planning to construct and operate the Humboldt Wind Energy Project (project) in south-central Humboldt County, California (Figure 1). The proposed project consists of up to 60 wind turbines and associated facilities including meteorological towers, electrical collection system, access roads, construction staging areas, a substation, an operations and maintenance facility, up to a 25-mile (mi) generation transmission line (gen-tie), and its associated point of interconnection. The project would have a nameplate generating capacity of up to 155 megawatts. Proposed turbine locations are situated on two ridgelines, Bear River Ridge and Monument Ridge, 4.7 mi south and southwest of Scotia, in Humboldt County, California (Figure 1).

The project area includes a 1,000-foot-(ft-) wide corridor centered on proposed turbine locations; a 200-ft-wide corridor centered on project roads, the electrical collection line, and the gen-tie; and a 500-ft-wide buffer around proposed staging and temporary impact areas and project substations (Figure 2). In addition to the wind turbines and associated facilities, several locations require temporary improvements to accommodate transportation of project components to the project site. These transportation improvement areas are located along Highway 101 from Depot Road along Humboldt Bay in the north to just south of Stafford (Figure 2). Transportation improvements will occur in five locations along this corridor, and for descriptive purposes are referred to as:

- Hookton Overpass
- Loleta Ramp
- Finch Creek Bridge and Bypass
- 12th Street Overpass Bypass
- Site Access (Jordan Gate)

The entire project area encompasses 2,244 acres (ac) and is divided into the following segments for description purposes:

- Bear River Ridge
- Western Monument Ridge
- Eastern Monument Ridge
- Monument Ridge – Highway 101
- Highway 101 – Shively Ridge
- Shively Ridge
- Bridgeville
- Transportation Route

Stantec Consulting Services Inc. (Stantec) prepared a Draft Biological Resources Work Plan (Draft Work Plan) detailing biological resource surveys designed to support project planning (Stantec 2018). In the spring, summer, and fall of 2018, Stantec conducted vegetation mapping and the 2018 botanical resources surveys as outlined in the Draft Work Plan. These studies are intended to provide information to support environmental review of the project in accordance with the California Environmental Quality Act and permit applications for plants listed under the Endangered Species Act (ESA) and California Endangered Species Act (CESA), if applicable.

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

Stantec mapped vegetation within the entire project area in 2018 (Figure 2). In addition, we conducted a comprehensive botanical survey of approximately 1,736 ac of the project area in 2018 (2018 survey area) (Figure 2). Stantec botanists also conducted a reconnaissance-level survey in the remaining 508 ac of the project area and will conduct a comprehensive botanical survey in the remaining 508 ac in the spring of 2019 (2019 survey area) to confirm the findings of the reconnaissance-level survey. We did not conduct a comprehensive botanical survey of these 508 ac in 2018 because timing of land access did not allow for a complete survey of these areas during appropriate plant identification periods. This report documents the methods and results of all botanical resource and vegetation mapping surveys in the project area conducted during 2018.

2.0 ENVIRONMENTAL SETTING

Humboldt County is within the Klamath/North Coast bioregion, and features a rocky coastline, montane forests, and small and sparsely populated settlements. The climate on the coast is cool and moist, driven by heavy rain and fog, and becomes progressively drier, warmer, and more variable inland while remaining relatively mild. In general, Humboldt County is mountainous and densely forested, with an expansive coastline that includes Humboldt Bay. Humboldt Bay, located about 16 mi north of the project, is the second largest estuary in California.

Humboldt County spans two geologic provinces: the Coast Ranges Province and the Klamath Mountains Province. The Coast Ranges Province in the county's center and southwest is composed mainly of the Franciscan Complex, with schists, sand, and other alluvial deposits associated with the coast. The Klamath Mountains Province in the northeast features older sedimentary rock including sandstone, chert, slate, and schist. The U.S. Department of Agriculture, Natural Resources Conservation Service (2018) has mapped 33 soil mapunits in the project area (Table 1, Figure 3). Soil mapunits have not been mapped in portions of Bridgeville.

Table 1. Soil Mapunits Within the Project Area

Mapunit Symbol	Mapunit Name
Water and Fluvents, 0 to 2 percent slopes	100
Weott, 0 to 2 percent slopes	110
Arlynda, 0 to 2 percent slopes	119
Jollygiant, 0 to 2 percent slopes	127
Typic Fluvaquents, 0 to 2 percent slopes	131
Udifluvents, 0 to 2 percent slopes	132
Parkland-Garberville complex, 2 to 9 percent slopes	151
Eelriver and Cottoneva soils, 0 to 2 percent slopes	179
Grizzlycreek-Chaddcreek complex, 2 to 9 percent slopes	181
Russ, 0 to 2 percent slopes	195
Ferndale, 0 to 2 percent slopes	220
Canalschool, 0 to 2 percent slopes	221
Hookton-Tablebluff complex, 2 to 9 percent slopes	230

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

Mapunit Symbol	Mapunit Name
Hookton-Tablebluff-Cannonball complex, 9 to 15 percent slopes	231
Tablebluff-Cannonball-Lepoil complex, 15 to 30 percent slopes	232
Cannonball-Candymountain-Lepoil complex, 30 to 50 percent slopes	233
Ferncat-Sleepyhollow-Oilcreek complex, 30 to 50 percent slopes	344
Sleepyhollow-Oilcreek complex, 50 to 75 percent slopes	345
Ferncat-Sleepyhollow complex, 9 to 30 percent slopes	368
Scoutcamp-Redcrest complex, 15 to 30 percent slopes	382
Scoutcamp-Rootcreek-Redcrest complex, 5 to 30 percent slopes	383
Scoutcamp-Rootcreek-Redcrest complex, 30 to 50 percent slopes	384
Scoutcamp-Redcrest complex, 50 to 75 percent slopes	385
Scoutcamp-Rootcreek-Redcrest complex, 50 to 75 percent slopes	386
Salmoncreek-Rootcreek complex, 2 to 15 percent slopes	387
Salmoncreek-Rootcreek complex, 15 to 30 percent slopes	388
Salmoncreek-Rootcreek complex, 30 to 50 percent slopes	389
Burgsblock-Coolyork-Tannin complex, 15 to 30 percent slopes	451
Burgsblock-Coolyork-Tannin complex, 30 to 50 percent slopes	452
Tannin-Burgsblock-Rockyglen complex, 30 to 50 percent slopes	461
Northbear-Caperidge-Taylorpeak complex, 30 to 50 percent slopes	505
Redwoodhouse-Yagercreek-Mailridge complex, 15 to 30 percent slopes	512
Redwoodhouse-Yagercreek-Mailridge complex, 30 to 50 percent slopes	513
Redwoodhouse-Yagercreek-Mailridge complex, 50 to 75 percent slopes	514
Redwoodhouse-Mailridge-Mountbaldy complex, 15 to 30 percent slopes	520
Crazycoyote-Sproulish-Caperidge complex, 15 to 50 percent slopes	567
Sproulish-Canoecreek-Redwohly complex, 30 to 50 percent slopes, warm	574
Canoecreek-Sproulish-Redwohly complex, 50 to 75 percent slopes, warm	575
Wirefence-Windynip-Devilshole complex, 5 to 30 percent slopes	646
Windynip-Wirefence-Devilshole complex, 30 to 50 percent slopes	649
Yorknorth-Witherell complex, 15 to 30 percent slopes	655
Yorknorth-Witherell complex, 30 to 50 percent slopes	662
Dryfield-Yorknorth-Witherell complex, 5 to 30 percent slopes	667
Hydraquents-Wassents mucky silt loam, strongly saline, 0-3 percent slopes, very frequently flooded	1009
Urban land-Friendlycity association, 0 to 2 percent	1010
Urban land-Anthraltic Xerorthents association, 0 to 2 percent slopes	1014
Peaked-Oceanhouse-Forhau complex, 5 to 30 percent slopes	4406
Dolason-Forhau-Peaked complex, 5 to 30 percent slopes	4408
Forhau-Peaked-Dolason complex, 30 to 50 percent slopes	4409

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

Mapunit Symbol	Mapunit Name
Hoagland-Chalkmountain-Pasturerock complex, 30 to 50 percent slopes	4417
Highyork-Elkcamp-Airstrip complex, 30 to 50 percent slopes	4422

Source: Natural Resources Conservation Service. 2018. USDA Web Soil Survey. <http://websoilsurvey.nrcs.usda.gov>. Accessed August 2018.

The project is primarily on privately owned and managed lands in rural, unincorporated south-central Humboldt County, 10 mi southeast of Ferndale, 20 mi south of Eureka, and 22 mi north of Garberville, California. Most of the project would be located on two ridgelines that are located south and east of the town of Scotia. Monument Ridge is located south and west of Highway 101 and the Eel River, and Shively Ridge is located north and east of Highway 101 and the Eel River.

The project area consists primarily of managed timberlands that are dominated by redwood (*Sequoia sempervirens*) forests and Douglas-fir (*Pseudotsuga menziesii*) forests, with annual grassland, hardwood, and chaparral inclusions. In addition to timber production, portions of the project area are managed for cattle grazing. The topography is diverse and steep in places, and elevation ranges from nearly sea level to just over 3,000 ft.

3.0 METHODS

3.1 DATABASE AND LITERATURE REVIEW

Stantec identified existing plant communities and potentially occurring special-status plant species in the project area using a combination of database searches, review of existing information, and vegetation mapping conducted during field visits. For the purpose of this evaluation, special-status plant species include plants that are: 1) listed as threatened or endangered under the CESA or the federal ESA; 2) proposed endangered or threatened by the U.S. Fish and Wildlife Service (USFWS); 3) designated as rare by the California Department of Fish and Wildlife (CDFW); 4) a state or federal candidate species for listing as threatened or endangered; and/or 5) have a California Rare Plant Rank (CRPR) of 1 or 2. All species encompassed in this list are included in the CDFW *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW 2018d).

Prior to conducting field work, we developed a list of special-status plant species that could occur in the project area. To develop this list, the following databases were searched: the California Natural Diversity Database (CNDDDB) (CDFW 2018b), the California Native Plant Society (CNPS) *Inventory of Rare and Endangered Plants* (CNPS 2018b), the USFWS database of federally protected species (USFWS 2018), and Humboldt Redwood Company, LLC (HRC) botanical resource data (HRC 2015). The CNDDDB was queried for reported occurrences of special-status plants within the 7.5-minute U.S. Geological Survey topographic quadrangles in the project area, as well as those immediately adjacent. Twenty-three quadrangles were included in the search: Arcata South, Blocksburg, Bridgeville, Buckeye Mtn., Bull Creek, Cannibal Island, Capetown, Eureka, Ferndale, Fields Landing Fortuna, Hydesville, Larabee Valley, McWhinney Creek, Myers Flat, Owl Creek, Petrolia, Redcrest, Scotia, Showers Mountain, Taylor Peak, Weott, and Yager Junction. The CNDDDB is a database consisting of historical observations of special-status plant species, wildlife species, and natural plant communities. Because the CNDDDB is limited to reported sightings, it

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

is not a comprehensive list of species that may occur in an area. However, it is useful in refining the list of special-status species that potentially occur in the project area.

Stantec also queried the CNPS online *Inventory of Rare and Endangered Plants of California* (CNPS 2018b), which allows users to search the inventory using a set of criteria (e.g., location, habitat, elevation). The CNPS inventory was queried for all CRPR 1, 2, 3, and 4 plants occurring in the same 23 quadrangles included in the CNDDDB query. All CRPR 3 and 4 plant species were included in the queries of the CNPS inventory to evaluate whether any of these plant species have the potential to occur in the project area. Finally, we queried the CNPS inventory for CRPR 1, 2, 3, and 4 plant occurrences in Humboldt County, from 1 to 3,600 ft. in elevation, for the following vegetation communities: coastal prairie, coastal scrub, cismontane woodland, meadows and seeps, North Coast coniferous forest, redwood forest, riparian woodland, and valley and foothill grassland.

Stantec also reviewed Trust Resources Reports generated from the USFWS Information, Planning, and Conservation System database, which summarizes federally listed species, critical habitat, and other biological resources potentially occurring in the project area (USFWS 2018). We also reviewed records included in the Consortium of California Herbaria (Consortium of California Herbaria 2018), Calflora (Calflora 2018), and HRC special-status plant occurrence data. Soil types mapped in the project area (Table 1, Figure 3) were also reviewed to determine if any unique soils (e.g., serpentine, limestone) are known to occur that may provide suitable habitat for special-status plant species.

For the purposes of this evaluation, we considered that a special-status species could occur within the project area if suitable habitat was present and its geographic and elevational ranges overlapped with the project area. All special-status plant species evaluated in the database searches and review of existing information are included in Appendix A. Based on the review of existing information, species habitat requirements, and habitat characteristics present in the project area, Stantec determined that 37 special-status and 38 CRPR 3 or 4 plant species have the potential to occur in the project area (Appendix A).

3.2 FIELD SURVEYS

3.2.1 Vegetation Mapping

Stantec conducted surveys to characterize vegetation communities and describe the existing environment in the complete project area in 2018 (Figure 2). Vegetation mapping followed the technical approach and vegetation alliance classification system described in *A Manual of California Vegetation*, 2nd Edition (MCV) (Sawyer et al. 2009) and updated in the current online edition (CNPS 2018a). The MCV represents the most recent efforts to provide a common and accepted vegetation classification system for use throughout California and classifies vegetation into a set of plant alliances, associations, special stands, or semi-natural stands. A plant species' dominance or importance in the stratum (i.e., tree, woody shrub/subshrub, or non-woody herbaceous) with the greatest amount of cover generally determines the vegetation alliance classification. The mapping effort included identifying and documenting all CDFW California Sensitive Natural Communities in the project area. Sensitive natural communities as defined by CDFW are those with a state rarity ranking of S1 (critically imperiled), S2 (imperiled), or S3 (vulnerable). To identify sensitive natural communities within the project area, we checked each vegetation community identified during field mapping against the California Natural Community List dated January 24, 2018 (CDFW 2018a).

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

Stantec botanists mapped vegetation in the field by walking through the project area and assessing vegetative cover within stands. The full extent, or a representative portion, of all vegetation communities mapped in the project area were visited during 2018 surveys. We classified all stands to the alliance level, or association level when an association was present. During field assessments, we identified and delineated the MCV or other alliance and association types onto field maps with aerial imagery. Stantec botanists delineated the boundaries of mapped vegetation communities based on characteristics observed in the field and vegetation signatures observed on aerial imagery. Information was collected by Stantec botanists to document each mapped vegetation community including: plant species composition (i.e., percent relative cover [% RC] of dominant and sub-dominant species within each stratum), stand structure, regional occurrence, and other notable characteristics. Stantec then digitized the delineated boundaries in current ArcGIS software for display and data query purposes.

Several vegetation communities were encountered in the project area that are not currently described in the MCV. As a result, and for the purposes of this project, we designated several new alliance and association types not currently provided in the MCV. These new alliances and associations were described by classifying dominant and sub-dominant vegetation and by assessing repeated plant species composition across the project area. Stantec assessed the status of new vegetation communities as sensitive natural communities based on existing CDFW classifications. CDFW considers all associations within sensitive alliances to be sensitive. As such, Stantec considered new associations mapped within existing sensitive alliances to be sensitive. For this assessment, we presumed that new alliances dominated by non-native species would not be considered sensitive communities. For new alliances and associations dominated by native species, we followed CDFW guidance and used corresponding vegetation types and listing status provided in *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986).

3.2.2 Botanical Resources

3.2.2.1 Reference Population Visits

To the extent practicable, we visited nearby reference populations of special-status or CRPR 3 or 4 plant species determined to potentially occur in the project area to ensure that the project botanists had an accurate search image for a species and to determine whether the species was identifiable at the time of our surveys. Reference site visits were made for plant occurrences documented by HRC or the CNDDDB near the project area.

Stantec botanist Tim Hanson conducted reference site visits with HRC botanist James Regan on March 20, 2018, of documented occurrences of coast fawn lily (*Erythronium revolutum*), Howell's montia (*Montia howellii*), maple-leaved checkerbloom (*Sidalcea malachroides*), Methuselah's beard lichen (*Usnea longissima*), Pacific gilia (*Gilia capitata* var. *pacifica*), short-leaved evax (*Hesperivax sparsiflora* var. *brevifolia*), and Siskiyou checkerbloom (*Sidalcea malviflora* ssp. *patula*). Mr. Hanson and Mr. Regan did not observe either the Coast fawn lily or short-leaved evax at the documented locations during the March 20 site visit. Howell's montia, maple-leaved checkerbloom, Pacific gilia, and Siskiyou checkerbloom were not flowering at the time of the initial reference site visits but were identified by both botanists based on previous knowledge of the populations, growth habit, and vegetative characteristics. Methuselah's beard lichen is identifiable at any point in the season due to its consistent appearance throughout the year.

Stantec botanists also visited reference populations of Humboldt County milk-vetch (*Astragalus agnicidus*), nodding semaphore grass (*Pleuropogon refractus*), and running-pine (*Lycopodium clavatum*) in or near the project area during subsequent field surveys. Humboldt County milk-vetch was observed in flower and fruit on July 20, 2018 at

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

documented occurrences about 3 miles south of the project area in the Larabee Creek drainage. Nodding semaphore grass was observed in flower on June 14, 2018 at a documented population in the project area on Western Monument Ridge. Running pine was observed on June 13, 2018 at a documented population in the project area on Shively Ridge. Reference populations were revisited on multiple occasions during the botanical field surveys to confirm phenology for identification purposes.

3.2.2.2 Field Investigation

Botanical surveys were conducted in accordance with the CDFW *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018c). Tim Hanson, Stantec staff botanist, served as the lead investigator for the botanical survey. Wendy Boes and Sara Taylor, Stantec staff botanists, provided additional field assistance. Mr. Hanson holds a Master of Science degree in Biological Sciences and has 9 years of experience conducting botanical surveys in California. Ms. Boes holds a Bachelor of Science degree in Botany and has 15 years of experience conducting botanical surveys in California. Ms. Taylor holds a Bachelor of Science degree in Environmental Studies and a Master of Science degree in Environmental Science. She has over 5 years of experience conducting botanical surveys in northern California and Oregon.

Stantec botanists conducted several survey passes of the project area, each of which consisted of walking meandering transects that covered all safely accessible portions of the 2018 survey area. We completed multiple survey passes to observe early-, mid-, and late-season blooming plants (Table 2), expending 396 person-hours of field survey time. The timing of the botanical field surveys coincided with the blooming period(s) for potentially occurring special-status and CRPR 3 or 4 plants in the project area and provides a comprehensive survey effort for these species within the 2018 survey area. Stantec also conducted reconnaissance level field surveys of the 2019 survey area to assess habitat suitability and record incidental observations of special-status or CRPR 3 or 4 plants.

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

Table 2. Humboldt Wind Energy Project Botanical Survey Dates in 2018

March	April	May	June	July	August
20	2	1	1	9	6
21	3	2	11	10	7
	4	3	12	11	8
	24	28	13	12	9
	25	29	14	23	10
	26	30	15	24	
	27	31	19	25	
			20	26	
			21	27	
			22		

The field surveys were floristic in nature; we identified each species observed to the taxonomic level necessary to determine whether the plant was listed as a special-status or CRPR 3 or 4 species or not. Plant taxonomy follows Baldwin et al. (2012), including applicable errata and supplements (Jepson Flora Project 2018). We also reviewed all non-native plant species observed to determine their status as invasive plants (i.e., noxious weeds) according to the ratings in the *California Invasive Plant Inventory* produced by California Invasive Plant Council (Cal-IPC) (Cal-IPC 2018). For this assessment, invasive plant species are those included in the Cal-IPC inventory with ratings of High, Moderate, or Limited.

4.0 RESULTS AND DISCUSSION

4.1 VEGETATION COMMUNITIES

Stantec mapped 83 vegetation communities in the project area to the alliance or association level (Figure 4 and Table 3). This includes 10 alliances and 14 associations not currently described in the MCV. Of these communities, those dominated by non-native/invasive species were not considered to be sensitive natural communities, and associations in existing sensitive alliances were considered sensitive. Remaining communities were assessed based upon status of a corresponding vegetation type in Holland per CDFW guidance. Two alliances and two associations dominated by native species do not have corresponding communities in Holland; Diana Hickson of CDFW was contacted regarding these communities; her response is pending.

Forty-three of the vegetation communities in the project area are categorized as sensitive natural communities (including new associations Stantec presumed to be considered sensitive by CDFW due to their inclusion in an existing sensitive alliance), which account for approximately 1,073 ac of the project area (Table 3). Each mapped vegetation alliance is described below. In general, vegetation communities are listed by stratum (i.e., tree, shrub, herb). Alliance descriptions are based on plant community characteristics observed in the project area and do not represent an exhaustive description of these alliances. Percent RC pertains to the dominant, co-dominant, or sub-dominant species in each stratum and not to the overall vegetation within a stand. This usage of % RC corresponds to the MCV guidelines and membership rules for classification.

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

Table 3. Vegetation Communities in the Project Area

Alliance	Association	Sensitive Natural Community	Map ID	Area (Acres)
¹ A Manual of California Vegetation Alliances and Associations				
Forests and Woodlands				
grand fir forest	No Association	Yes	6	1.5
bigleaf maple forest	<i>Acer macrophyllum</i>	Yes	10	0.6
	<i>Acer macrophyllum</i> – <i>Pseudotsuga menziesii</i> / <i>Polystichum munitum</i>	Yes	10.1	5.4
red alder forest	No Association	Yes	14	4.8
	<i>Alnus rubra</i> – <i>Salix lasiolepis</i>	Yes	14.1	1.2
madrone forest	No Association	Yes	15	2.9
tanoak forest	<i>Notholithocarpus densiflorus</i>	Yes	39	12.5
	<i>Notholithocarpus densiflorus</i> – <i>Arbutus menziesii</i>	Yes	39.1	26.9
	<i>Notholithocarpus densiflorus</i> – <i>Umbellularia californica</i>	Yes	39.2	7.4
	<i>Notholithocarpus densiflorus</i> – <i>Vaccinium ovatum</i>	Yes	39.3	11.5
² Monterey pine plantation	No Association	² No	40	0.4
Fremont cottonwood forest	<i>Populus fremontii</i>	Yes	68	0.8
black cottonwood forest	<i>Populus trichocarpa</i> – <i>Salix lasiandra</i>	Yes	70.1	0.8
Douglas-fir forest	<i>Pseudotsuga menziesii</i>	No	74	343.3
	<i>Pseudotsuga menziesii</i> – <i>Gaultheria shallon</i>	Yes	74.1	28.7
	<i>Pseudotsuga menziesii</i> – <i>Arbutus menziesii</i>	Yes	74.2	15.4
	<i>Pseudotsuga menziesii</i> – <i>Quercus garryana</i> var. <i>garryana</i> /grass	Yes	74.3	1.2
	<i>Pseudotsuga menziesii</i> – <i>Umbellularia californica</i> / <i>Polystichum munitum</i>	No	74.4	23.3
	<i>Pseudotsuga menziesii</i> / <i>Mahonia nervosa</i>	Yes	74.5	5.7
Douglas-fir–tanoak forest	<i>Pseudotsuga menziesii</i> – <i>Notholithocarpus densiflorus</i>	No	76	104.8
	<i>Pseudotsuga menziesii</i> – <i>Notholithocarpus densiflorus</i> / <i>Vaccinium ovatum</i> –(<i>Gaultheria shallon</i>)	No	76.1	103.5

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

Alliance	Association	Sensitive Natural Community	Map ID	Area (Acres)
¹ A Manual of California Vegetation Alliances and Associations				
	<i>Pseudotsuga menziesii</i> – <i>Notholithocarpus densiflorus</i> – (<i>Acer macrophyllum</i>)/ <i>Polystichum munitum</i>	No	76.2	53.8
	<i>Pseudotsuga menziesii</i> – <i>Notholithocarpus densiflorus</i> /Iris	No	76.3	1.4
	<i>Pseudotsuga menziesii</i> – <i>Notholithocarpus densiflorus</i> / <i>Mahonia nervosa</i>	No	76.4	0.5
	<i>Pseudotsuga menziesii</i> – <i>Notholithocarpus densiflorus</i> / <i>Achlys triphylla</i>	No	76.5	4.8
Oregon white oak woodland	No Association	Yes	82	5.8
	<i>Quercus garryana</i> – <i>Umbellularia californica</i> – <i>Quercus (agrifolia, kelloggii)</i>	Yes	82.1	0.4
shining willow groves	<i>Salix lasiandra</i>	Yes	91	2.5
redwood forest	<i>Sequoia sempervirens</i>	Yes	93	108.6
	<i>Sequoia sempervirens</i> – <i>Pteridium aquilinum</i>	Yes	93.1	9.5
	<i>Sequoia sempervirens</i> – <i>Polystichum munitum</i>	Yes	93.2	152.7
	³ <i>Sequoia sempervirens</i> – <i>Pseudotsuga menziesii</i> – <i>Notholithocarpus densiflorus</i> – <i>Vaccinium ovatum</i>	³ Yes	93.3	6.5
	<i>Sequoia sempervirens</i> – <i>Pseudotsuga menziesii</i> / <i>Gaultheria shallon</i>	Yes	93.4	381.2
	<i>Sequoia sempervirens</i> – <i>Pseudotsuga menziesii</i> / <i>Vaccinium ovatum</i>	Yes	93.5	26.6
	<i>Sequoia sempervirens</i> – <i>Pseudotsuga menziesii</i> – <i>Umbellularia californica</i>	Yes	93.6	15.5
	<i>Sequoia sempervirens</i> – <i>Acer macrophyllum</i> – <i>Umbellularia californica</i>	Yes	93.7	4.0
	<i>Sequoia sempervirens</i> – <i>Notholithocarpus densiflorus</i> / <i>Vaccinium ovatum</i>	Yes	93.8	60.8
California bay forest	<i>Umbellularia californica</i>	Yes	97	4.6

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

Alliance	Association	Sensitive Natural Community	Map ID	Area (Acres)
¹ A Manual of California Vegetation Alliances and Associations				
Shrublands				
⁴ redwood manzanita stands/montane manzanita chaparral	⁴ <i>Arctostaphylos columbiana</i>	⁴ No	904	1.4
coyote brush scrub	<i>Baccharis pilularis</i>	No	151	1.7
	<i>Baccharis pilularis</i> – <i>Ceanothus thyrsiflorus</i>	No	151.1	0.8
	<i>Baccharis pilularis</i> /Annual grass-herb	No	151.2	8.6
	<i>Baccharis pilularis</i> – <i>Toxicodendron diversilobum</i>	No	151.3	1.5
broom patches	No Association	No	156	1.5
blue blossom chaparral	No Association	No	169	4.6
	<i>Ceanothus thyrsiflorus</i> – <i>Vaccinium ovatum</i> – <i>Rubus parviflorus</i>	No	169.1	1.7
ocean spray brush	No Association	Yes	215	15.1
Himalayan blackberry–rattlebox–edible fig riparian scrub	<i>Rubus armeniacus</i>	No	272	3.5
coastal brambles	<i>Rubus parviflorus</i> – <i>Rubus spectabilis</i> – <i>Rubus ursinus</i>	Yes	273	1.5
	<i>Rubus ursinus</i>	Yes	273.1	3.7
	<i>Rubus spectabilis</i>	Yes	273.2	0.3
	<i>Rubus parviflorus</i>	Yes	273.3	1.6
arroyo willow thickets	<i>Salix lasiolepis</i>	No	282	3.8
poison oak scrub	No Association	No	301	1.1
Herbaceous				
⁶ Spanish lotus fields	⁶ <i>Acmispon americanus</i>	⁶ Not listed, insufficient data	910	0.1
⁴ spike bentgrass prairie/coastal terrace prairie	⁴ <i>Agrostis exarata</i>	⁴ Yes	900	57.8
	⁴ <i>Agrostis exarata</i> – <i>Holcus lanatus</i> – <i>Anthoxanthum odoratum</i>	⁴ Yes	900.1	1.5
	⁴ <i>Agrostis exarata</i> – <i>Juncus</i> spp.	⁴ Yes	900.2	12.6
⁵ yellow hairgrass grasslands	⁵ <i>Aira praecox</i>	⁵ No	903	0.9
⁵ sweet vernal grass meadows	No Association	⁵ No	911	0.9
upland mustards	<i>Brassica nigra</i>	No	330	2.0

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

Alliance	Association	Sensitive Natural Community	Map ID	Area (Acres)
¹ A Manual of California Vegetation Alliances and Associations				
annual brome grasslands	No Association	No	331	52.4
sand dune sedge swaths	<i>Carex praegracilis</i>	Yes	359	0.5
⁴ foothill sedge meadows	⁴ <i>Carex tumulicola</i>	⁴ Yes	905	0.1
pampas grass patches	<i>Cortaderia (jubata, selloana)</i>	No	374	3.9
annual dogtail grasslands	No Association	No	376	11.5
	<i>Cynosurus echinatus</i> – <i>Linum bienne</i> – <i>Brodiaea elegans</i>	No	376.1	2.6
California oat grass prairie	<i>Danthonia californica</i>	Yes	377	6.3
	³ <i>Danthonia californica</i> – <i>Juncus</i> spp.	³ Yes	377.1	3.7
	³ <i>Danthonia californica</i> – <i>Agrostis exarata</i>	³ Yes	377.2	14.9
tufted hair grass meadows	<i>Deschampsia cespitosa</i>	Yes	381	11.5
California brome-blue wildrye prairie	<i>Elymus glaucus</i>	Yes	388	35.6
⁴ coast buckwheat patches	⁴ <i>Eriogonum latifolium</i>	⁴ No	906	0.3
perennial rye grass fields	<i>Festuca perennis</i>	No	425	4.2
common velvet grass–sweet vernal grass meadows	<i>Holcus lanatus</i> – <i>Anthoxanthum odoratum</i>	No	400	142.6
	<i>Holcus lanatus</i>	No	400.1	24.7
soft rush marshes	<i>Juncus effusus</i>	No	407	4.0
western rush marshes	<i>Juncus patens</i>	No	412	0.8
⁵ pennyroyal marshes	⁵ <i>Mentha pulegium</i>	⁵ No	907	2.9
Harding grass–reed canary grass swards	<i>Phalaris aquatica</i>	No	446	8.4
⁵ purple awned wallaby grass prairie	⁵ <i>Rytidosperma penicillatum</i>	⁵ No	901	174.3
⁶ Wallace's spike moss mats	⁶ <i>Selaginella wallacei</i>	⁶ Not listed, insufficient data	909	0.3
Other Habitat Types				
⁵ barren/urban	No Association	⁵ No	908	18.0

¹A Manual of California Vegetation, 2nd Edition (Sawyer et al. 2009)

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

²CDFW recognizes Monterey pine forests as a sensitive natural community. However, the stands within the project area are roadside plantations that occur outside the Central Coast range of this species. Therefore, Stantec presumes these stands are not sensitive natural communities.

³Association not described in the MCV, but is included within an existing alliance in MCV that is designated as sensitive.

⁴Not described in MCV, corresponds to a vegetation type in Holland.

⁵Not described in MCV and dominated by invasive/non-native species (or barren/urban).

⁶Not described in MCV or in Holland. Insufficient data to determine sensitivity.

4.1.1 Forests and Woodlands

4.1.1.1 Grand Fir Forest

Grand fir (*Abies grandis*) forest alliance occurs as a small stand of trees along the proposed gen-tie route west of the Eel River. This forest community is dominated by grand fir (70–80% RC) with a few scattered Douglas-fir (10–20% RC). The understory is dominated by western sword fern (*Polystichum munitum*). Stantec mapped grand fir forest to the alliance level and did not observe associations in the project area. CDFW considers grand fir forest to be a sensitive natural community.

4.1.1.2 Bigleaf Maple Forest

Bigleaf maple (*Acer macrophyllum*) forest alliance occurs at two locations along the proposed gen-tie route: west of the Eel River and in the eastern portion of the project area near Bridgeville. This alliance is dominated by bigleaf maple (30–80% RC) and Douglas-fir. California blackberry (*Rubus ursinus*) and thimbleberry (*Rubus parviflorus*) are common in the shrub layer and western sword fern in the herbaceous layer. Stantec mapped two associations in the project area: *Acer macrophyllum* and *Acer macrophyllum*-*Pseudotsuga menziesii*/*Polystichum munitum*. CDFW considers all associations within bigleaf maple forest to be sensitive natural communities.

4.1.1.3 Red Alder Forest

Red alder (*Alnus rubra*) forest alliance occurs as relatively small stands of trees in seeps or along the banks of creeks, rivers, and small drainages in the project area. This forest community is dominated by red alder (60–80% RC) with arroyo willow (*Salix lasiolepis*) (30–40% RC), and blackberry (*Rubus* spp.) in the shrub layer. Where shrubs are absent, western sword fern occurs and is dominant. Stantec mapped red alder forest at both the alliance level and at the association level (*Alnus rubra*-*Salix lasiolepis*). CDFW considers red alder forest to be a sensitive natural community.

4.1.1.4 Madrone Forest

Madrone (*Arbutus menziesii*) forest alliance occurs in openings along road sides and as relatively small stands in forested areas. Stands are found scattered throughout the project area. This forest community is dominated by madrone (60–80% RC) with less cover of Douglas-fir and tanoak (*Notholithocarpus densiflorus*). Stands within the project area lack a developed understory, most likely due to high canopy cover, a relatively thick layer of leaf litter, and the species' tendency to form dense seedling and sapling patches. Stantec mapped madrone forest at the alliance level only. CDFW considers madrone forest to be a sensitive natural community.

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

4.1.1.5 Tanoak Forest

Tanoak forest alliance is common to the project area and occurs scattered throughout. This forest community is dominated by a tree layer of tanoak (>60% RC) and was commonly observed by Stantec botanists co-dominating with madrone and California bay (*Umbellularia californica*). California huckleberry (*Vaccinium ovatum*) is also present in the understory of several stands with moderate to high cover. Stantec mapped four associations in the project area: *Notholithocarpus densiflorus*, *Notholithocarpus densiflorus - Arbutus menziesii*, *Notholithocarpus densiflorus - Umbellularia californica*, and *Notholithocarpus densiflorus - Vaccinium ovatum*. CDFW considers all associations within tanoak forest to be sensitive natural communities.

4.1.1.6 Monterey Pine Plantations

Two stands of Monterey pine (*Pinus radiata*) plantations are located in the project area. Both locations are small areas in the Transportation Route bounded by Highway 101 offramps and county roads. In both locations, Monterey pine accounts for 100% of the tree species in the stand, with a moderate herbaceous layer dominated by *Anthoxanthum odoratum* (*Anthoxanthum odoratum*) and rattlesnake grass (*Briza maxima*). Monterey pine has been widely planted outside of its original range in the Central Coast, where it is known only from three remaining native stands. Naturally occurring stands of Monterey pine are considered sensitive by CDFW. However, the two stands in the project area are planted as landscape and are therefore not considered a sensitive natural community.

4.1.1.7 Fremont Cottonwood Forest

Fremont cottonwood (*Populus fremontii*) forest alliance occurs along the edge of Alder Point Road in the eastern portion of the project area. Fremont cottonwood is dominant with >50% RC and in association with various willows (*Salix* spp.), Himalayan blackberry (*Rubus armeniacus*), and coyote brush (*Baccharis pilularis*). Stantec mapped one association in the project area: *Populus fremontii*. CDFW considers Fremont cottonwood forest to be a sensitive natural community.

4.1.1.8 Black Cottonwood Forest

Black cottonwood (*Populus trichocarpa*) forest alliance occurs along the east bank of the Eel River as a relatively narrow, linear stand of riparian trees and shrubs. This forest community is dominated by black cottonwood and Pacific willow (*Salix lasiandra* var. *lasiandra*). Stantec mapped one association in the project area: *Populus trichocarpa - Salix lasiandra*. CDFW considers black cottonwood forest to be a sensitive natural community.

4.1.1.9 Douglas-Fir Forest

Douglas-fir forest alliance is one of the most abundant forest community types in the project area. It is also one of the most variable in community composition due to stands existing in various states of succession. Douglas-fir (70–80% RC) stands in early seral stages with no developed shrub or herbaceous layers are present in areas grazed by cattle and in areas recently logged. More developed stands had sub-dominant hardwoods such as California bay, madrone, and Oregon white oak (*Quercus garryana* var. *garryana*). Other Douglas-fir stands had little to no hardwood cover and a more developed shrub layer with high % RC of salal (*Gaultheria shallon*) and Oregon grape (*Mahonia nervosa*). Other dominant species present in the understory include poison oak (*Toxicodendron diversilobum*), California huckleberry, and western sword fern. Stantec mapped six associations: *Pseudotsuga menziesii*, *Pseudotsuga menziesii - Gaultheria shallon*, *Pseudotsuga menziesii - Arbutus menziesii*, *Pseudotsuga menziesii -*

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

Quercus garryana var. *garryana*/grass, *Pseudotsuga menziesii*-*Umbellularia californica*/*Polystichum munitum*, and *Pseudotsuga menziesii*/*Mahonia nervosa*. CDFW considers the *Pseudotsuga menziesii* - *Gaultheria shallon*, *Pseudotsuga menziesii* - *Arbutus menziesii*, *Pseudotsuga menziesii*-*Quercus garryana* var. *garryana*/grass, and *Pseudotsuga menziesii*/*Mahonia nervosa* associations within the Douglas-fir forest alliance to be sensitive natural communities.

4.1.1.10 Douglas-Fir-Tanoak Forest

Douglas-fir-tanoak forest alliance is an abundant forest community type in the project area and is variable in its composition. This forest community contains a tree layer of Douglas-fir and tanoak, and both species have 30–60% RC. Several stands have little to no shrub or herbaceous layer, but most stands have varying combinations of California huckleberry, Iris (*Iris* spp.), Oregon grape, and salal. Stantec mapped six associations in the project area: *Pseudotsuga menziesii* - *Notholithocarpus densiflorus*, *Pseudotsuga menziesii* - *Notholithocarpus densiflorus*/*Vaccinium ovatum* - (*Gaultheria shallon*), *Pseudotsuga menziesii* - *Notholithocarpus densiflorus*-(*Acer macrophyllum*)/*Polystichum munitum*, *Pseudotsuga menziesii*- *Notholithocarpus densiflorus*/*Iris*, *Pseudotsuga menziesii*-*Notholithocarpus densiflorus*/*Mahonia nervosa*, and *Pseudotsuga menziesii*-*Notholithocarpus densiflorus*/*Achlys triphylla*. CDFW does not consider any of the associations observed in the Douglas-fir-tanoak forest in the project area to be sensitive natural communities.

4.1.1.11 Oregon White Oak Woodland

Oregon white oak woodland alliance occurs alongside grasslands in the eastern portion of the project area. This woodland community is dominated by Oregon white oak (50–80% RC) with Douglas-fir sometimes co-dominating or present with much less cover. Other hardwoods, such as California bay and black oak (*Quercus kelloggii*), were also present in the tree layer. In the understory, stands have a variety of grasses and forbs along with poison oak. Stantec mapped Oregon white oak woodland to the alliance level and one association level: *Quercus garryana* - *Umbellularia californica* - *Quercus (agrifolia, kelloggii)*. CDFW considers Oregon white oak woodland to be a sensitive natural community.

4.1.1.12 Shining Willow Groves

Shining willow groves alliance occurs in seeps and drainages in the project area. This woodland community is dominated by Pacific willow and was observed forming dense thickets with native and non-native blackberry (*Rubus* spp.). Stantec mapped one association, in the project area: *Salix lasiandra*. CDFW considers shining willow groves to be a sensitive natural community.

4.1.1.13 Redwood Forest

Redwood forest alliance is one of the most abundant forest community types in the project area and is the most variable in community composition due to stands being in various states of succession. Stands of redwood (40–80% RC) generally co-dominate with Douglas-fir (30–70% RC) in the tree layer; however, several stands have sub-dominant to co-dominant hardwoods such as bigleaf maple, California bay, and tanoak. Most of the developed stands have a mixture of California huckleberry and salal in the understory. Several stands with less dense canopy cover have moderate to dense cover of bracken fern (*Pteridium aquilinum* var. *pubescens*) or western sword fern. Stands with undeveloped shrub or herbaceous layers are common and present in early seral stage stands, areas grazed by

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

cattle, and in recently logged areas. Stantec mapped nine associations in the project area: *Sequoia sempervirens*, *Sequoia sempervirens* - *Pteridium aquilinum*, *Sequoia sempervirens* - *Polystichum munitum*, *Sequoia sempervirens* - *Pseudotsuga menziesii* - *Notholithocarpus densiflorus* - *Vaccinium ovatum*, *Sequoia sempervirens* - *Pseudotsuga menziesii*/*Gaultheria shallon*, *Sequoia sempervirens*-*Pseudotsuga menziesii*/*Vaccinium ovatum*, *Sequoia sempervirens*-*Pseudotsuga menziesii*-*Umbellularia californica*, *Sequoia sempervirens* - *Acer macrophyllum* - *Umbellularia californica*, and *Sequoia sempervirens*-*Notholithocarpus densiflorus*/*Vaccinium ovatum*. CDFW considers all associations within redwood forest to be sensitive natural communities.

4.1.1.14 California Bay Forest

California bay forest alliance occurs as small stands in the project area. This forest community is dominated by California bay with madrone or tanoak co-dominating in the tree layer. The understory is relatively open and often dominated by sapling California bay, tanoak, or madrone. Stantec mapped one association in the project area: *Umbellularia californica*. CDFW considers California bay forest to be a sensitive natural community.

4.1.2 Shrublands

4.1.2.1 Redwood Manzanita Stands

Redwood manzanita (*Arctostaphylos columbiana*) stands alliance occurs in the project area in one opening within Douglas-fir forest. This shrub community is dominated by redwood manzanita (60–80% RC) with coyote brush, blue blossom, and poison oak interspersed throughout. This alliance and association (*Arctostaphylos columbiana*) were developed by Stantec during vegetation mapping. Redwood manzanita stands alliance is not currently described in the MCV, but CDFW does not consider the corresponding Holland classification (montane manzanita chaparral) to be a sensitive natural community.

4.1.2.2 Coyote Brush Scrub

Coyote brush scrub alliance occurs in forest openings and in disturbed areas such as log landings and along roadsides. This shrub community is common in the project area and is generally dominated by coyote brush (50–80% RC). Stands are present with various shrubs including blackberry (*Rubus* spp.), poison oak, blue blossom (*Ceanothus thyrsiflorus*), and redwood manzanita. Co-dominant species in the herbaceous layer include many non-native annual grass species and pampas grass (*Cortaderia* spp.). Stantec mapped four associations in the project area: *Baccharis pilularis*, *Baccharis pilularis*-*Ceanothus thyrsiflorus*, *Baccharis pilularis*/Annual grass-herb, and *Baccharis pilularis*-*Toxicodendron diversilobum*. CDFW does not consider any of the coyote brush scrub associations observed in the project area to be sensitive natural communities.

4.1.2.3 Broom Patches

Broom patches semi-natural alliance occurs in very disturbed, partially developed landscapes within the project area. This shrub community is generally dominated by scotch broom (*Cytisus scoparius*) or French broom (*Genista monspessulana*) (50–70% RC) and sometimes co-dominates with Himalayan blackberry (30–50% RC). Stantec mapped all broom patches in the project area to the alliance level. CDFW does not consider broom patches to be a sensitive natural community.

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

4.1.2.4 Blue Blossom Chaparral

Blue blossom chaparral alliance occurs in forest openings and disturbed areas, such as log landings and roadsides. This shrub community is characterized by blue blossom (35–70% RC) and is present in pure stands with grasses and forbs as well as in stands co-dominating with California huckleberry and redwood manzanita. Stantec mapped blue blossom chaparral to the alliance level and one association level (*Ceanothus thyrsiflorus-Vaccinium ovatum-Rubus parviflorus*). CDFW does not consider any of the associations of blue blossom chaparral observed in the project area to be sensitive natural communities.

4.1.2.5 Ocean Spray Brush

Ocean spray (*Holodiscus discolor*) brush alliance occurs in dense stands bordering grasslands in the western portion of the project area. This shrub community is dominated by ocean spray (70–90% RC) and is present in stands mixed with California blackberry, thimbleberry, poison oak, and coast man-root (*Marah oregana*). Many of these stands have coast man-root growing over the tops of the ocean spray. Stantec did not observe any associations in the project area; therefore, ocean spray brush was mapped to the alliance level only. CDFW considers ocean spray brush to be a sensitive natural community.

4.1.2.6 Himalayan Blackberry – Rattlebox – Edible Fig Riparian Scrub

Himalayan blackberry - rattlebox - edible fig riparian scrub semi-natural alliance occurs in very disturbed, partially developed landscapes in the project area. This shrub community is dominated by Himalayan blackberry (50% RC) and includes other introduced species such as firethorn (*Pyracantha* spp.) (10–20% RC), poison oak (20–30% RC), and bromes (*Bromus* spp.) (10–30% RC). Stantec mapped one association in the project area: *Rubus armeniacus*. CDFW does not consider Himalayan blackberry - rattlebox - edible fig riparian scrub to be a sensitive natural community.

4.1.2.7 Coastal Brambles

Coastal bramble alliance occurs in disturbed areas such as roadsides and in forest openings throughout the project area. This shrub community is dominated by California blackberry (60–80% RC), thimbleberry (60–80% RC), or salmonberry (*Rubus spectabilis*) (60–80% RC), or a combination of these species. Many stands have coast man-root (10–20% RC) or grasses and forbs growing throughout. Stantec mapped four associations: *Rubus parviflorus-spectabilis-ursinus*, *Rubus ursinus*, *Rubus spectabilis*, and *Rubus parviflorus*. CDFW considers all associations within coastal brambles to be sensitive natural communities.

4.1.2.8 Arroyo Willow Thickets

Arroyo willow thickets alliance occurs in deep drainages within the grassland prairies and along ditches in the Transportation Route near Highway 101. This shrub community is dominated by arroyo willow (70–80% RC) with occasional Douglas-fir (10–20% RC). Stantec mapped one association in the project area: *Salix lasiolepis*. CDFW considers arroyo willow thickets to be a sensitive natural community.

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

4.1.2.9 Poison Oak Scrub

Poison oak scrub alliance occurs along the proposed gen-tie route in the eastern portion of the project area. This shrub community is dominated by poison oak (60–80% RC) and was often mixed with coyote brush (10–15% RC) and Himalayan blackberry (10–20% RC). Poison oak sometimes occurred in pure stands with scattered grasses and forbs. Stantec mapped poison oak scrub to the alliance level only. CDFW does not consider poison oak scrub to be a sensitive natural community.

4.1.3 Herbaceous Vegetation

4.1.3.1 Spanish Lotus Fields

Spanish lotus (*Acmispon americanus*) fields alliance occurs in one location within grasslands in the western portion of the project area. This herbaceous plant community is dominated by Spanish lotus (70–80% RC), which occur in dense patches on the flanks of a shallow drainage. Other sub-dominant species in this stand are purple awned wallaby grass (30–40% RC) and English plantain (*Plantago lanceolata*) (10–20% RC). This alliance and association (*Acmispon americanus*) were developed by Stantec during vegetation mapping. CDFW has not assessed the status of Spanish lotus fields as a sensitive natural community and this alliance does not have a corresponding community in Holland. Diana Hickson of CDFW was contacted regarding the sensitive status of this community; her response is pending.

4.1.3.2 Spike Bentgrass Prairie

Spike bentgrass (*Agrostis exarata*) prairie alliance occurs in the Transportation Route in wet depressions within large grasslands. This herbaceous plant community is characterized by spike bentgrass (30–60% RC) and in many stands co-dominates with common velvet grass (*Holcus lanatus*) (20–30% RC) and sweet vernal grass (10–30% RC). Several stands contained a high density of rush species (10–30% RC), including slender rush (*Juncus occidentalis*), Bolander's rush (*Juncus bolanderi*), and toad rush (*Juncus bufonius*). This alliance and its associations were developed by Stantec during vegetation mapping. Associations include *Agrostis exarata* - *Holcus lanatus* - *Anthoxanthum odoratum* and *Agrostis exarata* - *Juncus* spp. Spike bentgrass prairie alliance is not currently described in the MCV, but CDFW considers the corresponding Holland classification (coastal terrace prairie) to be a sensitive natural community.

4.1.3.3 Yellow Hairgrass Grasslands

Yellow hairgrass grasslands (*Aira praecox*) semi-natural alliance occurs in the western portion of the project area. This herbaceous plant community is limited to shallow soils on top of rolling grasslands and is dominated by yellow hairgrass (70–80% RC). Overall grass cover is low in this stand type. In some stands, yellow hairgrass co-dominates with sheep sorrel (*Rumex acetosella*) (40–60% RC); bracken fern and bristly dogtail grass (*Cynosurus echinatus*) are also present at lower cover. This alliance and association (*Aira praecox*) were developed by Stantec during vegetation mapping. CDFW has not assessed the status of yellow hairgrass grasslands as a sensitive natural community. For this assessment, Stantec presumes that CDFW would not consider yellow hairgrass grassland a sensitive natural community because it is dominated by non-native species.

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

4.1.3.4 Sweet Vernal Grass Meadows

Sweet vernal grass meadows semi-natural alliance is common in the Transportation Route and is dominated by sweet vernal grass (40–80% RC). In many stands it co-dominates with other grasses such as rattlesnake grass and velvet grass or non-native forbs such as jointed charlock (*Raphanus sativus*) or English plantain. CDFW has not assessed the status of sweet vernal grass meadows as a sensitive natural community, and for this assessment, Stantec presumes that CDFW would not consider it a sensitive community because it is dominated by non-native species.

4.1.3.5 Upland Mustards

Upland mustards semi-natural alliance occurs in disturbed landscapes within the project area. This herbaceous plant community is characterized by black mustard (*Brassica nigra*) (20–40% RC) and a high diversity of introduced grasses and forbs. Introduced plants are common in this community and include English plantain, bristly dogtail grass, bromes (*Bromus* spp.), and Mediterranean barley (*Hordeum marinum*). Stantec mapped one association in the project area: *Brassica nigra*. CDFW does not consider upland mustards to be a sensitive natural community.

4.1.3.6 Annual Brome Grasslands

Annual brome grasslands semi-natural alliance occurs in disturbed areas and within large grassland prairies in the project area. This herbaceous plant community is generally dominated by soft chess (*Bromus hordeaceus*) (40% RC) and is associated with other introduced annual grasses such as bristly dogtail grass (20% RC), rattail sixweeks grass (*Festuca myuros*) (30% RC), and ripgut grass (*Bromus diandrus*) (10% RC). Stantec mapped this herbaceous community to the alliance level. CDFW does not consider annual brome grasslands to be a sensitive natural community.

4.1.3.7 Sand Dune Sedge Swaths

Sand dune sedge swaths alliance occurs as a small, linear stand along a wet, grassland ridgetop in the western portion of the project area and Stantec only observed it in one location. This herbaceous plant community is characterized by field sedge (*Carex praegracilis*) (30% RC) but is heavily invaded with introduced herbs such as smooth cats ear (*Hypochaeris glabra*) (30–50% RC), English plantain (15% RC), and bristly dogtail grass (5% RC). Bracken fern (20% RC) was also observed in this stand. Stantec mapped one association in the project area: *Carex praegracilis*. CDFW considers sand dune sedge swaths to be a sensitive natural community.

4.1.3.8 Foothill Sedge Meadows

Foothill sedge meadows alliance occurs in one location; a large grassland in the central portion of the project area. This herbaceous plant community is limited to a wet seep where foothill sedge (*Carex tumulicola*) (70–80% RC) dominates the stand. Several other species such as rush (*Juncus* spp.) and blue wild-rye are mixed throughout but have low cover. This alliance and association (*Carex tumulicola*) were developed by Stantec during vegetation mapping. CDFW has not assessed the status of foothill sedge meadows as a sensitive natural community.

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

4.1.3.9 Pampas Grass Patches

Pampas grass patches semi-natural alliance occurs in disturbed areas throughout the project area. This herbaceous plant community is characterized by pampas grass (50–80% RC) with varying amounts of coyote brush and Himalayan blackberry at lower covers. Introduced grasses and forbs are also present within this alliance. Stantec mapped one association in the project area: *Cortaderia (jubata, selloana)*. CDFW does not consider pampas grass patches to be a sensitive natural community.

4.1.3.10 Annual Dogtail Grasslands

Annual dogtail grasslands semi-natural alliance occurs as small stands (<1 ac) on the top of grassy slopes in dry, rocky, shallow soils throughout grassland prairies and in disturbed roadside areas. This herbaceous plant community is dominated by bristly dogtail grass (50% RC) and is associated with other introduced herbs such as flax (*Linum bienne*), smooth cats ear, soft chess, and rattail sixweeks grass. This alliance generally has a high cover of introduced annual and perennial herbs. One stand in the project area has a low cover of several native species. Native species present include California plantain (*Plantago erecta*), tarweed (*Madia* spp.), and harvest brodiaea (*Brodiaea elegans*). This plant community was mapped to the alliance level and one association level (*Cynosurus echinatus - Linum bienne - Brodiaea elegans*). CDFW does not consider annual dogtail grasslands to be a sensitive natural community.

4.1.3.11 California Oat Grass Prairie

California oat grass (*Danthonia californica*) prairie alliance occurs in the western and eastern portions of the project area within large, open grasslands. This herbaceous plant community is characterized by California oatgrass and historically dominated many coastal grasslands in California. Introduction of grazing likely changed the composition of these stands, leading to a community with less California oatgrass (40–60% RC) and more introduced annual and perennial grasses and forbs. Currently, stands are characterized by a combination of introduced annual species, including bromes and smooth cat's ear, and perennial native and introduced species, including California oatgrass, rushes (*Juncus* spp.), purple awned wallaby grass (*Rytidosperma penicillatum*), and narrow leaved flax (*Linum bienne*). Stantec mapped one MCV association in the project area: *Danthonia californica*. Stantec also created two association types during vegetation mapping: *Danthonia californica-Juncus* spp. and *Danthonia californica-Agrostis exarata*. CDFW considers all associations within California oat grass prairie to be sensitive natural communities.

4.1.3.12 Tufted Hair Grass Meadows

Tufted hair grass (*Deschampsia cespitosa*) meadow alliance occurs in the western portion of the project area within large, open grasslands. This herbaceous plant community is characterized by tufted hairgrass (30–60% RC), a perennial bunchgrass. Although MCV membership rules require >50% RC of tufted hairgrass in the herbaceous layer to classify the stand to this type, other native perennial grass cover was considered to define these stands as the tufted hair grass meadow alliance. Other native perennial grasses that were observed throughout the stands are spike bent grass (*Agrostis exarata*) (10–40% RC) and California oatgrass (10–30% RC). Historically, tufted hairgrass stands were maintained by fire (Walsh 1995) and without fire their composition has changed to include introduced annual and perennial herbs such as purple awned wallaby grass (*Rytidosperma penicillatum*) (10–20% RC), English plantain (10–20% RC), and smooth cats ear (20–40% RC). Stantec mapped one association in the project area: *Deschampsia cespitosa*. CDFW considers tufted hair grass meadows to be a sensitive natural community.

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

4.1.3.13 California Brome-Blue Wildrye Prairie

California brome-blue wildrye (*Elymus glaucus* ssp. *glaucus*) prairie alliance occurs in small openings along forest edges and roadsides. This herbaceous plant community is characterized by blue wild-rye (30–50% RC) and bracken fern (10–30% RC), but is heavily invaded by introduced grasses such as common velvet grass (20–30% RC), sweet vernal grass (10–20% RC), and bromes (10–20% RC). Stantec mapped one association in the project area: *Elymus glaucus*. CDFW considers California brome-blue wildrye prairie to be a sensitive natural community.

4.1.3.14 Coast Buckwheat Patches

Coast buckwheat (*Eriogonum latifolium*) patches alliance occurs in disturbed locations in grasslands in the western portion of the project area. This herbaceous plant community is limited to old gravel pits with well-drained soils and is dominated by coast buckwheat (50% RC). Other species present in this community include common velvet grass, sheep sorrel, and rattail sixweeks grass. This alliance and association (*Eriogonum latifolium*) were developed by Stantec during vegetation mapping. Coast buckwheat patches alliance is not currently described in the MCV, but CDFW does not consider the corresponding Holland classification (northern coastal bluff scrub) to be a sensitive natural community.

4.1.3.15 Common Velvet Grass – Sweet Vernal Grass Meadows

Common velvet grass–sweet vernal grass meadows semi-natural alliance is one of the most abundant herbaceous community types and occurs throughout the project area. This herbaceous plant community is dominated by common velvet grass (40–80% RC) and in many stands co-dominates with sweet vernal grass (40–50% RC). Other associate species in this stand type include California oatgrass, bracken fern, bristly dogtail grass, tall fescue (*Festuca arundinacea*), and non-native bromes. Stantec mapped two associations in the project area: *Holcus lanatus* - *Anthoxanthum odoratum* and *Holcus lanatus*. CDFW does not consider common velvet grass – sweet vernal grass meadows to be a sensitive natural community.

4.1.3.16 Soft Rush Marshes

Soft rush (*Juncus effusus* ssp. *pacificus*) marsh alliance occurs in wet seeps and drainages within large grasslands in the eastern and western portions of the project area. This herbaceous plant community is dominated by soft rush (80–90% RC). Very few other species were observed within this type due to its dense cover. Stantec mapped one association in the project area: *Juncus effusus*. CDFW does not consider soft rush marshes to be a sensitive natural community.

4.1.3.17 Western Rush Marshes

Western rush (*Juncus patens*) marshes alliance occurs in wet seeps and drainages within the large grasslands in the eastern and western portion of the project area. This herbaceous plant community is dominated by western rush (70–80% RC) and in some stands is co-dominant with soft rush (20–30% RC). Other associated species within this stand type are Harding grass (*Phalaris aquatica*) (10–30% RC) and pennyroyal (*Mentha pulegium*) (10–30% RC). Stantec mapped one association in the project area: *Juncus patens*. CDFW does not consider western rush marshes to be a sensitive natural community.

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

4.1.3.18 Pennyroyal Marshes

Pennyroyal semi-natural alliance occurs in wet depressions and shallow drainages throughout grasslands in the project area. This herbaceous plant community is dominated by pennyroyal (60–90% RC) with some native species present such as tufted hairgrass, sedges (*Carex* spp.), and rushes. Native species are inconspicuous in these stands, with 5–20% RC overall. This alliance and association (*Mentha pulegium*) were developed by Stantec during vegetation mapping. CDFW has not assessed the status of pennyroyal marshes as a sensitive natural community. For this assessment, Stantec presumes that CDFW would not consider pennyroyal marshes a sensitive natural community because it is dominated by non-native species.

4.1.3.19 Perennial Rye Grass Fields

Perennial rye grass (*Festuca perennis*) fields semi-natural alliance occurs in small stands west of the Eel River. This herbaceous plant community is dominated by perennial rye grass (60–80% RC) with sub-dominant grasses present such as common velvet grass, sweet vernal grass, and blue wild-rye. Stantec mapped one association in the project area: *Festuca perennis*. CDFW does not consider perennial rye grass fields to be a sensitive natural community.

4.1.3.20 Harding Grass-Reed Canary Grass Swards

Harding grass-reed canary grass swards semi-natural alliance occurs in the eastern portion of the project area on wet, steep slopes within large grasslands. It is also found in disturbed areas along roadsides. This herbaceous plant community is dominated by Harding grass (40–80% RC) with medusa head (*Elymus caput-medusae*) and non-native bromes present as well. Stantec mapped one association in the project area: *Phalaris aquatica*. CDFW does not consider any associations within Harding grass-reed canary grass swards to be sensitive natural communities.

4.1.3.21 Purple Awned Wallaby Grass Prairie

Purple awned wallaby grass prairie semi-natural alliance occurs throughout the larger grasslands and in disturbed areas. It is one of the most common herbaceous stand types found in the project area. This herbaceous plant community is dominated by purple awned wallaby grass (30–70% RC) and, in some stands, co-dominates with common velvet grass (10–30% RC) and sweet vernal grass (10–20% RC). In general, this stand type has a lower density of grass cover compared to other herbaceous stand types. This alliance and association (*Rytidosperma penicillatum*) were developed by Stantec during vegetation mapping. CDFW has not assessed the status of purple awned wallaby grass prairie as a sensitive natural community. For this assessment, Stantec presumes that CDFW would not consider purple awned wallaby grass prairie a sensitive natural community because it is dominated by non-native species.

4.1.3.22 Wallace's Spike Moss Mats

Wallace's spike moss mats alliance occurs in one location within grasslands in the eastern portion of the project area. This herbaceous plant community is located on a west facing, rocky outcrop. At this location Wallace's spike moss (*Selaginella wallacei*) (50–60% RC) dominates the rock surface, and grasses such as blue wild-rye (10–30% RC) and wild oat (*Avena fatua*) (10–20% RC) dominate the area outside the rock outcrop. This alliance and association (*Selaginella wallacei*) were developed by Stantec during vegetation mapping. CDFW has not assessed the status of Wallace's spike moss mats as a sensitive natural community and this alliance does not have a corresponding

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

community in Holland. Diana Hickson of CDFW was contacted regarding the sensitive status of this community; her response is pending.

4.1.4 Other

4.1.4.1 Barren/Urban

Barren/urban was developed by Stantec to delineate areas that are not vegetated or are landscaped. These areas include roads, road shoulders, structures and associated landscaping, and parking areas. For this assessment, Stantec presumes that barren/urban is not a sensitive natural community because it is not a natural community.

4.2 SPECIAL-STATUS SPECIES

All special-status plant species evaluated in the database searches and review of other existing information are included in Appendix A. Based on the review of existing information, species habitat requirements, and habitat characteristics present in the project area, Stantec determined that 37 special-status plant species have the potential to occur in the project area (Appendix A).

Stantec identified four special-status plant species in the project area during the 2018 botanical surveys (Table 4). The species are further described in the subsections that follow. Stantec did not document any federally or state-listed plant species in the project area during the 2018 botanical surveys. The locations of all special-status plant occurrences found in the project area during the 2018 botanical surveys are shown in Figure 5.

Table 4. Special-Status Plant Species Identified in the Humboldt Wind Energy Project During 2018 Botanical Surveys

Species	Status ¹ (Federal/ State/CRPR)	Number of Occurrences Identified in the Project Area
Pacific gilia (<i>Gilia capitata</i> ssp. <i>pacifica</i>)	NL/NL/1B.2	3
short-leaved evax (<i>Hesper-evax sparsiflora</i> var. <i>brevifolia</i>)	NL/NL/1B.2	2
Howell's montia (<i>Montia howellii</i>)	NL/NL/2B.2	2
Siskiyou checkerbloom (<i>Sidalcea malviflora</i> ssp. <i>patula</i>)	NL/NL/1B.2	2

¹ Federal and State Codes:

T = Threatened; E = Endangered; R = Rare; NL = Not Listed

California Rare Plant Rank Codes and Threat Ranks:

- 1B Plants rare, threatened, or endangered in California and elsewhere.
- 2B 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.
- 0.1 Seriously endangered in California
- 0.2 Fairly endangered in California

Field surveys were conducted in the 2018 survey area during time periods where all potentially occurring special-status plant species could be identified if they were present. No adverse conditions (e.g., drought, herbivory) were encountered that would affect the identification of potential special-status plant species. Special-status plants observed at reference populations were consistent with previously reported conditions, suggesting that conditions during the 2018 survey period represent normal conditions for the area. All plants identified in the project area during the 2018 botanical surveys are listed in Appendix B. Representative photographs of each special-status plant species identified in the project area are shown in Appendix C. Stantec completed CNDDB forms documenting all special-status plant occurrences identified in the project area. Updated CNDDB forms were also completed for documented special-status plant occurrences in the project area that were not observed during field surveys.

4.2.1 Pacific Gilia

Pacific gilia is not protected under the CESA or the ESA and is a CRPR 1B.2 species. Pacific gilia is an herbaceous annual plant in the phlox family (Polemoniaceae) that grows in the coastal mountains of northern California and southern Oregon. Pacific gilia grows on steep slopes and open flats in coastal prairies, grassland, and dune habitats. This species flowers between May and August and generally occurs at elevations below 1,300 ft. Occurrences of Pacific gilia were found growing in coastal prairie habitat on Monument Ridge and on the Monument Ridge – Highway 101 gen-tie segment. The three Pacific gilia occurrences observed in the project area occupy a total of 0.95 acre and contain an estimated 1,495 plants.

4.2.2 Short-Leaved Evax

Short-leaved evax is not protected under the CESA or the ESA and is a CRPR 1B.2 species. Short-leaved evax is an herbaceous annual plant in the sunflower family that grows on coastal bluffs and prairies in northern California and southern Oregon and is restricted to a relatively narrow band along the Pacific coast. Short-leaved evax flowers between May and August and generally occurs at elevations below 710 ft., although we found it in the project area at two locations above 2,200 ft. Occurrences of short-leaved evax were found growing in coastal prairie habitat on Bear River Ridge. The two short-leaved evax occurrences observed in the project area occupy a total of 0.17 acre and contain an estimated 1,150 plants.

4.2.3 Howell's Montia

Howell's montia is not protected under the CESA or the ESA and is a CRPR 2B.2 species. Howell's montia is an herbaceous annual plant in the miner's lettuce family (Montiaceae) that is only known to occur in Humboldt and Trinity counties. This species grows in vernal wet, often compacted soils, including roadbeds. Howell's montia generally flowers between March and May and occurs at elevations below 2,740 ft. Occurrences of Howell's montia were found in moderately used roadbeds near Monument Ridge and on the Monument Ridge – Highway 101 gen-tie segment. The two Howell's montia occurrences observed in the project area occupy a total of 0.15 acre and contain about 70 plants.

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

4.2.4 Siskiyou Checkerbloom

Siskiyou checkerbloom is not protected under the CESA or the ESA and is a CRPR 1B.2 species. Siskiyou checkerbloom is an herbaceous perennial plant in the mallow family that grows in open coastal forests and prairies in northwestern California and southern Oregon. This species generally flowers between May and August and occurs at elevations between 50 and 2,890 ft. Occurrences of Siskiyou checkerbloom were located in coastal prairie on Bear River Ridge. The two Siskiyou checkerbloom occurrences observed in the project area occupy a total of 17.31 acres and contain about 2,001 plants.

4.3 CRPR 3 OR 4 PLANT SPECIES

All CRPR 3 or 4 plant species evaluated in the database searches and review of other existing information are listed in Appendix A. Based on the review of existing information, species habitat requirements, and habitat characteristics present in the project area, Stantec determined that 38 CRPR 3 or 4 plant species have the potential to occur in the project area (Appendix A).

Stantec identified 11 CRPR 3 or 4 plant species in the project area during the 2018 botanical surveys (Table 5). The species are further described in the subsections that follow. The locations of all CRPR 3 or 4 plant species occurrences found in the project area during the 2018 botanical surveys are shown in Figure 5.

Table 5. California Rare Plant Rank 3 or 4 Plant Species Identified in the Humboldt Wind Energy Project During 2018 Botanical Surveys

Species	Status ¹ (Federal/ State/CRPR)	Number of Occurrences Identified in the Project Area
Methuselah's beard lichen (<i>Usnea longissima</i>)	NL/NL/4.2	7
Pacific golden saxifrage (<i>Chrysosplenium glechomifolium</i>)	NL/NL/4.3	1
Tracy's tarplant (<i>Hemizonia congesta</i> ssp. <i>tracyi</i>)	NL/NL/4.3	4
redwood lily (<i>Lilium rubescens</i>)	NL/NL/4.2	9
heart-leaved twayblade (<i>Listera cordata</i>)	NL/NL/4.2	8
running-pine (<i>Lycopodium clavatum</i>)	NL/NL/4.1	2
leafy-stemmed mitrewort (<i>Mitellastra caulescens</i>)	NL/NL/4.2	1

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

Species	Status ¹ (Federal/ State/CRPR)	Number of Occurrences Identified in the Project Area
California pinefoot (<i>Pityopus californicus</i>)	NL/NL/4.2	5
nodding semaphore grass (<i>Pleuropogon refractus</i>)	NL/NL/4.2	9
hoary gooseberry (<i>Ribes roezlii</i> var. <i>amictum</i>)	NL/NL/4.3	3
maple-leaved checkerbloom (<i>Sidalcea malachroides</i>)	NL/NL/4.2	1

¹ Federal and State Codes:

T = Threatened; E = Endangered; R = Rare; NL = Not Listed

California Rare Plant Rank Codes and Threat Ranks:

- 1B Plants rare, threatened, or endangered in California and elsewhere.
- 2B 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.
- 0.1 Seriously endangered in California
- 0.2 Fairly endangered in California
- 0.3 Not very endangered in California

Stantec took representative photographs of each CRPR 3 or 4 plant species identified in the project area (Appendix C). Stantec completed CNDDDB forms documenting all CRPR 3 or 4 plant occurrences identified in the project area. Stantec also completed updated CNDDDB forms for documented CRPR 3 or 4 plant occurrences in the project area that were not observed during field surveys.

4.3.1 Methuselah's Beard Lichen

Methuselah's beard lichen is not protected under the CESA or the ESA and is a CRPR 4.2 species. This species has a nearly circumboreal distribution and occurs in variety of coniferous and broadleaf forests habitats. In California, it is restricted to the coastal mountains north of the San Francisco Bay Area at elevations from 160 to 4,790 ft. This long, pendulous lichen grows on tree branches and is often found in old-growth forest habitats, although it also grows in forests with no old-growth characteristics. We found Methuselah's beard lichen in the project area growing on big-leaf maple, California bay, coast redwood, grand fir, and tanoak. Occurrences were located on Bear River and Monument ridges and on the Monument Ridge – Highway 101 gen-tie segment. The seven Methuselah's beard lichen occurrences observed in the project area occupy a total of 4.93 acres and contain an estimated 382 plants.

4.3.2 Pacific Golden Saxifrage

Pacific golden saxifrage (*Chrysosplenium glechomifolium*) is not protected under the CESA or the ESA and is a CRPR 4.3 species. Pacific golden saxifrage is an herbaceous perennial plant in the saxifrage family (Saxifragaceae) that occurs in the western US from California to Washington. This species grows in wet habitats including seeps, springs, and streambanks. This species flowers between February and June and is found in California at elevations between 30 and 720 ft. A single occurrence of Pacific golden saxifrage was located in the project area in a seep

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

within mature Douglas-fir forest on the north side of Bear River Ridge. The single Pacific golden saxifrage occurrence observed in the project area occupies a total of 0.04 acre. This occurrence was growing as a continuous, rhizomatous mat and differentiation of individual plants was not possible.

4.3.3 Tracy's Tarplant

Tracy's tarplant (*Hemizonia congesta* ssp. *tracyi*) is not protected under the CESA or the ESA and is a CRPR 4.3 species. Tracy's tarplant is an herbaceous annual plant in the sunflower family (Asteraceae). This species is only known to occur in northwestern California in Humboldt, Mendocino, and Trinity counties in coastal prairie and grassy openings in scrub, woodland, and forest habitats. This species flowers between May and October and generally occurs at elevations between 390 and 3,940 ft. Occurrences of Tracy's tarplant were found growing in coastal prairie habitat on Bear River and Monument ridges. The four Tracy's tarplant occurrences observed in the project area occupy a total of 1.73 acres and contain an estimated 2,750 plants.

4.3.4 Redwood Lily

Redwood lily (*Lilium rubescens*) is not protected under the CESA or the ESA and is a CRPR 4.2 species. Redwood lily is an herbaceous perennial plant in the lily family (Liliaceae) that grows in dry shrubland and forest habitats in northwestern California. This species generally flowers between April and August and occurs at elevations between 100 and 6,260 ft. Occurrences of redwood lily were found growing in dry Douglas-fir and tan oak forests on Eastern Monument Ridge and on the Shively Ridge and Bridgeville gen-tie segments. Unconfirmed *Lilium* species at two mapped occurrences (LIRU-8 and LIRU-9) on the Shively Ridge and Bridgeville gen-tie segments (Figure 5) did not flower this year and Stantec was not able to positively identify to species. For the purposes of this report, these two occurrences are presumed to be redwood lily based on habitat characteristics and the presence of other known redwood lily occurrences in the vicinity. The nine redwood lily occurrences observed in the project area occupy a total of 0.50 acre and contain an estimated 78 plants.

4.3.5 Heart-Leaved Twayblade

Heart-leaved twayblade (*Listera cordata*) is not protected under the CESA or the ESA and is a CRPR 4.2 species. Heart-leaved twayblade is an herbaceous perennial plant in the orchid family (Orchidaceae) that grows in moist forest habitats throughout northern North America and into Eurasia. This species flowers between February and July and occurs at elevations between 20 and 4,490 ft. Occurrences of heart-leaved twayblade were found growing in both redwood - Douglas-fir and redwood forest habitats on Bear River, Monument, and Shively ridges. The eight heart-leaved twayblade occurrences observed in the project area occupy a total of 0.29 acre and contain an estimated 362 plants.

4.3.6 Running-Pine

Running-pine is not protected under the CESA or the ESA and is a CRPR 4.1 species. Running-pine is a creeping perennial plant in the club-moss family (Lycopodiaceae) that grows on moist ground in forest habitats and in marshes. This species has an extensive, world-wide range but in California it is restricted to the North Coast at elevations below 4,000 ft. Occurrences of running-pine were found growing in redwood forest habitats on Shively Ridge. The two running-pine occurrences observed in the project area occupy a total of 0.20 acre. These occurrences were growing in continuous, rhizomatous mats and differentiation of individual plants was not possible.

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

4.3.7 Leafy-Stemmed Mitrewort

Leafy-stemmed mitrewort (*Mitellastra caulescens*) is not protected under the CESA or the ESA and is a CRPR 4.2 species. Leafy-stemmed mitrewort is an herbaceous perennial plant in the saxifrage family that grows in wet, shady areas in forests and along streams from northwestern California to British Columbia. This species flowers between May and August and occurs at elevations between 20 and 5,580 ft. A single occurrence of leafy-stemmed mitrewort was located in the project area in redwood forest along Greenlow Creek. The one leafy-stemmed mitrewort occurrence observed in the project area occupies a total of 0.29 acre and contains an estimated 300 plants.

4.3.8 California Pinefoot

California pinefoot (*Pityopus californicus*) is not protected under the CESA or the ESA and is a CRPR 4.2 species. California pinefoot is an herbaceous perennial plant in the heath family (Ericaceae) that grows in coniferous or mixed-deciduous forests in California, Oregon, and Washington. This species generally flowers between May and August and occurs at elevations between 50 and 7,300 ft. Occurrences of California pinefoot were found in mixed tan oak and Douglas-fir forest on the eastern portion of Monument Ridge. The five California pinefoot occurrences observed in the project area occupy a total of 0.04 acre and contain 15 plants.

4.3.9 Nodding Semaphore Grass

Nodding semaphore grass is not protected under the CESA or the ESA and is a CRPR 4.2 species. Nodding semaphore grass is a perennial plant in the grass family (Poaceae) that grows in seeps and other wet forest habitats in California, Oregon, and Washington. This species generally flowers between April and September and occurs at elevations between sea level and 5,250 ft. Occurrences of nodding semaphore grass were found in seeps in coniferous forest habitats on Bear River and Monument ridges, and on the Monument Ridge – Highway 101 gen-tie segment. The nine nodding semaphore grass occurrences observed in the project area occupy a total of 1.30 acres and contain an estimated 835 plants.

4.3.10 Hoary Gooseberry

Hoary gooseberry (*Ribes roezlii* var. *amictum*) is not protected under the CESA or the ESA and is a CRPR 4.3 species. Hoary gooseberry is a perennial shrub in the gooseberry family (Grossulariaceae) that grows in forest and woodland habitats and is restricted to northwestern California. This species flowers between March and April and occurs at elevations between sea level and 7,500 ft. Occurrences of hoary gooseberry were found in Douglas-fir forest and coastal prairie on Western Monument Ridge. The three hoary gooseberry occurrences observed in the project area occupy a total of 11.34 acres and contain an estimated 300 plants.

4.3.11 Maple-Leaved Checkerbloom

Maple-leaved checkerbloom is not protected under the CESA or the ESA and is a CRPR 4.2 species. Maple-leaved checkerbloom is an herbaceous perennial subshrub in the mallow family (Malvaceae) that grows in forests and woodlands near the Pacific coast in California and southern Oregon. This species generally flowers between April and August and occurs at elevations between sea level and 2,390 ft. One occurrence of maple-leaved checkerbloom was found in mixed redwood and Douglas-fir forest along the proposed access road corridor on Eastern Monument

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

Ridge. The one maple-leaved checkerbloom occurrence observed in the project area occupies less than 0.01 acre and contains one plant.

4.4 INVASIVE SPECIES

Seven invasive plant species with Cal-IPC ratings of High were located in the project area: Andean pampas grass (*Cortaderia jubata*), fennel (*Foeniculum vulgare*), French broom, Himalayan blackberry, medusa head, scotch broom (*Cytisus scoparius*), and spotted knapweed (*Centaurea stoebe* ssp. *micranthos*). We observed an additional 36 invasive plant species with Cal-IPC ratings of Moderate or Limited. All invasive species observed in the project area and their associated Cal-IPC ratings are summarized in Appendix B.

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

5.0 REFERENCES

- Baldwin, B. G., D. H. Goldman, D. J. Keil, R. Patterson, T. J. Rosatti, and D. H. Wilken, editors. 2012. The Jepson manual: vascular plants of California, second edition. University of California Press, Berkeley, California.
- Calflora. 2018. Information on California plants for education, research and conservation, with data contributed by public and private institutions and individuals, including the Consortium of California Herbaria. [Internet]. Berkeley, California: The Calflora Database [a non-profit organization]. <http://www.calflora.org/>. Accessed May 2018.
- California Department of Fish and Wildlife (CDFW). 2018a. California Natural Community List, January 24, 2018. Vegetation Classification and Mapping Program. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=153398&inline>. Accessed August 2018.
- _____. 2018b. California Natural Diversity Database. RareFind 5 [Internet]. California Department of Fish and Wildlife, Sacramento, California. <https://www.wildlife.ca.gov/Data/CNDDDB/Maps-and-Data>. Accessed March 2018.
- _____. 2018c. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities. California Natural Resources Agency Department of Fish and Wildlife.
- _____. 2018d. Special vascular plants, bryophytes, and lichens list. California Department of Fish and Wildlife, Natural Diversity Database. Periodic publication. List updated August 2018. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109383&inline>. Accessed August 2018.
- California Invasive Plant Council (Cal-IPC). 2018. The Cal-IPC Inventory. <https://www.cal-ipc.org/plants/inventory/>. Accessed August 2018.
- California Native Plant Society (CNPS). 2018a. A Manual of California Vegetation, Online Edition. <http://vegetation.cnps.org>. Accessed June 2018.
- _____. 2018b. Inventory of rare and endangered plants of California (online edition, v8-03 0.39). <http://www.rareplants.cnps.org/>. Accessed March 2018.
- Consortium of California Herbaria. 2018. Data provided by the participants of the Consortium of California Herbaria [Online]. <http://ucjeps.berkeley.edu/consortium/>. Accessed June 2018.
- Holland, R. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. State of California. The Resources Agency, California Department of Fish and Game.
- Humboldt Redwood Company (HRC). 2015. Rare Plants Annual Report. Humboldt Redwood Company, Scotia, California. December 1, 2015. 47 pp. <https://www.hrcllc.com/habitat-conservation-plan-hcp-reports>. Accessed March 2018.
- Jepson Flora Project. 2018. Jepson eFlora. <http://ucjeps.berkeley.edu/eflora/>. Accessed June 2018.

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

Natural Resources Conservation Service. 2018. Web Soil Survey. <http://websoilsurvey.nrcs.usda.gov>. Accessed August 2018.

Sawyer, J. O., T. Keeler-Wolf, and J. M. Evens. 2009. A manual of California vegetation, 2nd edition. California Native Plant Society, Sacramento, California.

Stantec. 2018. Humboldt Wind Energy Project, Administrative Draft Biological Resources Work Plan.

U.S. Fish and Wildlife Service (USFWS). 2018. Environmental Conservation Online System, Information for Planning and Consultation [Online]. <https://ecos.fws.gov/ipac/>. Accessed March 2018.

Walsh, R. A. 1995. *Deschampsia caespitosa*. Fire Effects Information System [Online]. USDA Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. Fort Collins, Colorado.

FIGURES

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

Figure 1. General Overview Map

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

Figure 2. Botanical Resources Survey Areas

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

Figure 3. Soils Map

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

Figure 4. Vegetation Communities

HUMBOLDT WIND ENERGY PROJECT BOTANICAL RESOURCES REPORT

Figure 5. Botanical Resources Survey Results Map

APPENDICES

Appendix A PLANT SPECIES EVALUATED

Appendix B PLANT SPECIES OBSERVED

**Appendix C REPRESENTATIVE PHOTOGRAPHS OF SPECIAL-
STATUS AND CRPR 3 OR 4 PLANT SPECIES**