



P.O. Box 733, Hydesville, CA 95547 . (707) 768-3743 . (707) 768-3747 fax

Botanical Survey Report Journey Aquarian Project

Prepared by
Kelsey McDonald
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For
Hohman and Associates
Hydesville, CA

Signature: Kelsey McDonald

Date: 10/16/19

Setting

The Aquarian Cannabis Cultivation Project is located in Section 19, 20, & 30, Township 4 South, Range 5 East HB&M; Humboldt County, on the Harris USGS 7.5' quadrangle. The project area is 5 miles east of the town of Garberville, CA, off of Harris Road. The Journey Aquarian project includes APNs 216-135-015, 216-081-013, 216-135-010, 216-136-004, and 216-135-008. The biogeographic region can be described using a three-tiered hierarchy of province, region and sub-region. This site lies within the California Floristic Province, Northwestern California region, and North Coast sub-region. Perington Creek runs through the property, and the parcel lies ~4 miles upstream from the Eel River. The elevation ranges from approximately 1400 to 2600 feet. Slopes on the property are moderate, and the aspect is primarily southeast facing. The vegetation is mapped by the USFS CalVeg as primarily grasslands, with Oregon oak (*Quercus garryana*) woodlands. The property is approximately 685 acres.

Methods

Kelsey McDonald, Kevin Landaw, and Monique Silva-Crossman conducted the botanical surveys for the Journey Aquarian project on 3/4/19, 4/29/19, 5/9/19, 6/29/19, and 9/4/19. Kelsey McDonald is a CNPS Certified Consulting Botanist, and she holds a M.S. in Natural Resources with a concentration in Environmental Science from Humboldt State University. Kelsey has taken relevant courses including plant taxonomy, field botany, and plant biology, and she wrote her thesis on the seed dispersal of invasive cordgrass *Spartina densiflora* in Humboldt Bay. She has over 5 years of botany experience in Northern California. Kevin holds a B.S. in Botany from Humboldt State University, where he is currently a graduate student. Monique holds a M.S. in Environmental Science and Management from Humboldt State University where she studied the effects of manual and mechanical *Ammophila arenaria* removal techniques on coastal dune plant communities and morphology. Both Kevin and Monique have taken relevant courses including plant taxonomy and ecology.

The surveys were floristic in nature and seasonally appropriate, with surveys spread throughout the spring and summer to catch early and later-blooming species. Approximately 52 field hours were spent on surveys. Surveys included systematic assessment of all potential habitats in the area based on maps, aerial photos, and visible environmental features such as canopy cover, slope, soil texture, aspect, hydrologic features, and associated vegetation. This survey protocol is based on the Protocol for Surveying and Evaluating Impacts to Special Status native Plant Populations and Natural Communities (CDFW 2018). A list of potential rare plants on CNPS lists 1 and 2 found within the 9-quad area as listed in CDFW BIOS and CNPS Inventory of Rare and Endangered Plants is available in Attachment A. Attachment B provides details on potential rare plants. Attachment C contains habitat photos of the project area. Attachment D lists all plants identified from botanical surveys. Attachment E contains a map of the botanical survey routes. Attachment F contains rare plant rank definitions.

Results

No protected rare or endangered plants (CNPS List 1 or 2) were identified within the proposed disturbance areas or elsewhere on the Journey Aquarian property. The area is a mosaic of grasslands, oak woodlands, and Douglas fir forest. Grasslands were primarily dominated by invasive harding grass (*Phalaris aquatica*), but also contained a diversity of native grasses and wildflowers. Oak woodlands on the property included Oregon oak (*Quercus garryana*) woodlands (G4 S3) and mixed oak woodlands with Kellogg's black oak (*Quercus kelloggii*), bay laurel (*Umbellularia californica*), canyon live oak (*Quercus chrysolepis*), and interior live oak (*Quercus wislizeni*). Although the property is mostly open, it also contained some areas of Douglas fir (*Pseudotsuga menziesii*) and tanoak (*Notholithocarpus densiflorus*) dominance (G3 S3). Riparian areas also contained a good deal of bigleaf maple (*Acer macrophyllum*), California buckeye (*Aesculus californica*), and Oregon ash (*Fraxinus latifolia*). Wetlands occurred on the property, including artificial ponds. A wetland restoration plan is being prepared for the large in-stream pond on APN 216-135-003. Artificial ponds were also observed on APN 216-081-013. An artificial stock pond on APN 216-081-015 and associated class IV channel was noted ~60 feet downhill from a planned cultivation relocation area.

Remediation by replanting site-appropriate native species is recommended for cultivation areas within riparian woodlands. The property supports high-quality habitat with a diversity of native species, and increased disturbance and movement of soil and other materials has the potential to impact sensitive natural communities by increasing the spread of invasive plants. Invasive species control is recommended for French broom (*Genista monspessulana*), teasel (*Dipsacus fullonum*), bull thistle (*Cirsium vulgare*), Italian thistle (*Carduus pycnocephalus*), and Canada thistle (*Cirsium arvense*) on the property. These invasive plants were sparsely distributed in disturbed areas of the property, and they should be pulled each year in the spring prior to setting seed. Surveys were timed appropriately to detect early-, mid-, and late-blooming species. All potential rare plant habitats around cultivation areas were surveyed, and false negative surveys are unlikely. No additional surveys are necessary, and no additional mitigation is needed for rare plants.

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Attachment A: List of Potentially Occurring Sensitive Plant Species

Scientific Name	Common Name	CESA	FESA	CRPR	Flowering Period	Habitat Availability
<i>Arabis mcdonaldiana</i>	McDonald's rockcress	Endangered	Endangered	1B.1	May-Jul	Potential
<i>Arctostaphylos stanfordiana</i> ssp. <i>raichei</i>	Raiche's manzanita	None	None	1B.1	Feb-Apr	Potential
<i>Astragalus agnicidus</i>	Humboldt County milk-vetch	Endangered	None	1B.1	Apr-Sep	Potential
<i>Carex arcta</i>	Northern clustered sedge	None	None	2B.2	June-Sept	Potential
<i>Ceanothus foliosus</i> var. <i>vineatus</i>	Vine Hill ceanothus	None	None	1B.1	Mar-May	Potential
<i>Eriogonum kelloggii</i>	Kellogg's buckwheat	Endangered	None	1B.2	(May)Jun-Aug	Unlikely-Serpentine
<i>Erythronium oregonum</i>	giant fawn lily	None	None	2B.2	Mar-Jun (Jul)	Potential
<i>Erythronium revolutum</i>	coast fawn lily	None	None	2B.2	Mar-Jul (Aug)	Potential
<i>Frangula purshiana</i> ssp. <i>ultramafica</i>	Caribou coffeeberry	None	None	1B.2	May-Jul	Unlikely-Serpentine
<i>Gentiana setigera</i>	Mendocino gentian	None	None	1B.2	(Apr-Jul) Aug-Sep	Potential
<i>Howellia aquatilis</i>	water howellia	None	Threatened	2B.2	Jun	Potential
<i>Kopsiopsis hookeri</i>	small groundcone	None	None	2B.3	Apr-Aug	Potential
<i>Montia howellii</i>	Howell's montia	None	None	2B.2	(Jan-Feb) Mar-May	Potential
<i>Piperia candida</i>	white-flowered rein orchid	None	None	1B.2	(Mar)May-Sep	Potential
<i>Sedum laxum</i> ssp. <i>eastwoodiae</i>	Red Mountain stonecrop	None	None	1B.2	May-Jul	No
<i>Sidalcea malviflora</i> ssp. <i>patula</i>	Siskiyou checkerbloom	None	None	1B.2	(April) May-Aug	Potential
<i>Tracyina rostrata</i>	beaked tracyina	None	None	1B.2	May-Jun	Potential
<i>Viburnum ellipticum</i>	oval-leaved viburnum	None	None	2B.3	May-Jun	Potential

Attachment B: Potential Rare Plant Details

1. McDonald's rockcress (*Arabis mcdonaldiana*)

Status: CNPS List 1 rare, threatened, or endangered in California and elsewhere; .1 seriously endangered in CA. State and federally listed as endangered. State rank S3: Vulnerable. Global rank G3: Vulnerable.

Family: Brassicaceae

Flowering: May – July

Habitat: Upper montane coniferous forest (metamorphic, rocky) Lower montane coniferous forest, Upper montane coniferous forest

Habitat in Project Area: Potential habitat might exist in forested areas.

2. Raiche's manzanita (*Arctostaphylos stanfordiana* ssp. *raichei*)

Status: CNPS List 1 rare, threatened, or endangered in California and elsewhere; .1 seriously endangered in CA. No state or federal listing. State Rank S2: Imperiled. Global Rank G3T2: Vulnerable.

Family: Ericaceae

Flowering: Feb-April

Habitat: Chaparral, Lower montane coniferous forest (openings) Volcanic, Chaparral, Cismontane woodland, Lower montane coniferous forest

Habitat in Project Area: Potential habitat might exist in woodland and forest openings.

3. Humboldt County milk-vetch (*Astragalus agnicidus*)

Status: CNPS List 1 rare, threatened, or endangered in California and elsewhere; .1 seriously endangered in CA. State listed as endangered, no federal listing. State rank S2: Imperiled. Global rank G2: Imperiled.

Family: Fabaceae

Flowering: April - September

Habitat: openings, disturbed areas, sometimes roadsides. Broadleafed upland forest, North Coast coniferous forest

Habitat in Project Area: Potential habitat exists in forested areas.

4. Northern clustered sedge (*Carex arcta*)

Status: CNPS List 2 Plants Rare, Threatened or Endangered in California, 2, fairly endangered in CA. No state or federal listing. S1: Critically Imperiled. Global rank G5: Secure.

Family: Cyperaceae

Flowering: June - September

Habitat: Bogs and fens, North Coast coniferous forest (mesic)

Habitat in Project Area: Potential habitat exists in forested areas or possible fens.

5. Vine Hill ceanothus (*Ceanothus foliosus* var. *vineatus*)

Status: CNPS List 1 rare, threatened, or endangered in California or elsewhere; .1 seriously endangered in CA. No state or federal listing. State rank S1: critically imperiled. Global rank G3T1: Vulnerable.

Family: Fabaceae

Flowering: April-July

Habitat: Chaparral, Cismontane woodland, Lower montane coniferous forest
Habitat in Project Area: Potential habitat exists in woodland and forested areas.

6. Kellogg's buckwheat (*Eriogonum kelloggii*)

Status: CNPS List 1 rare, threatened, or endangered in California and elsewhere; .2 somewhat endangered in CA. No federal listing. State listed as endangered. State rank S2: Imperiled. Global rank G2: Imperiled.

Family: Polygonaceae

Flowering: (May) June-August

Habitat: Lower montane coniferous forest (rocky, serpentinite)

Habitat in Project Area: Potential habitat exists in any rocky and serpentine areas of the forest.

7. Giant fawn lily (*Erythronium oregonum*)

Status: CNPS List 2, Plants Rare, Threatened or Endangered in California, .2 Moderately threatened in California. No state or federal listing. State Rank S2: Imperiled. Global Rank G4G5: Apparently Secure/Secure.

Family: Liliaceae

Flowering: March – June (July)

Habitat: Cismontane woodland, Meadows and seeps

Habitat in Project Area: Potential habitat exists in meadows and woodland areas.

8. Coast fawn lily (*Erythronium revolutum*)

Status: CNPS List 2, Plants Rare, Threatened or Endangered in California, .2 Moderately threatened in California. No state or federal listing. State Rank S3: Vulnerable. Global Rank G4G5: Apparently Secure/Secure.

Family: Liliaceae

Flowering: March – July (August)

Habitat: Bogs and fens, Broadleafed upland forest, North Coast coniferous forest

Habitat in Project Area: Potential habitat exists in forested areas.

9. Caribou coffeeberry (*Frangula purshiana* spp. *ultramafica*)

Status: CNPS List 1 rare, threatened, or endangered in California and elsewhere, .2 somewhat endangered in CA. No state or federal listing. State rank S2S3: Imperiled/Vulnerable. Global rank G4T2T3: Apparently Secure.

Family: Rhamnaceae

Flowering: May – July

Habitat: serpentinite. Chaparral, Lower montane coniferous forest, Meadows and seeps, Upper montane coniferous forest

Habitat in Project Area: Unlikely to occur; no apparent serpentine soil.

10. Mendocino gentian (*Gentiana setigera*)

Status: CNPS List 1 rare, threatened, or endangered in California and elsewhere; .2 somewhat endangered in CA. No state or federal listing. State rank S1: Critically Imperiled. Global rank G2: Imperiled.

Family: Gentianaceae

Flowering: (April – July) August - September

Habitat: Lower montane coniferous forest, Meadows and seeps

Habitat in Project Area: Potential habitat exists in meadows and forested areas.

11. Water howellia (*Howellia aquatilis*)

Status: CNPS List 2 rare, threatened, or endangered in California, .2 fairly endangered in CA. Federally listed as threatened; no state listing. State rank S2: imperiled. Global rank G3: vulnerable.

Family: Campanulaceae

Flowering: June

Habitat: Marshes and swamps (freshwater).

Habitat in Project Area: Potential habitat exists in marshes or riparian areas.

12. Small groundcone (*Kopsiopsis hookeri*)

Status: CNPS List 2 endangered in CA, .3 not very endangered in CA; need more information. No state or federal listing. State Rank S1S2: critically imperiled to imperiled; Global Rank G4?: apparently secure.

Family: Orobanchaceae

Flowering: April - August

Habitat: North Coast coniferous forest

Habitat in Project Area: Potential habitat exists in forested areas.

13. Howell's montia (*Montia howellii*)

Status: CNPS List 2 rare, threatened, or endangered in California, .2 fairly endangered in CA. Federally listed as threatened; no state listing. State rank S2: imperiled. Global rank G3: vulnerable.

Family: Montiaceae

Flowering: Jan – Feb (March – May)

Habitat: Meadows and seeps, North Coast coniferous forest, Vernal pools

Habitat in Project Area: Potential habitat exists in meadows and forested areas.

14. White-flowered rein orchid (*Piperia candida*)

Status: CNPS List 1 Rare or Endangered in California and elsewhere, .2 moderately endangered in California. No state or federal listing. State Rank S3: Vulnerable. Global Rank G3: Vulnerable.

Family: Orchidaceae

Flowering: (March) May - Sept

Habitat: Broadleafed upland forest, Lower montane coniferous forest, North Coast coniferous forest

Status within Area: Potential habitat exists in forested areas.

15. Red Mountain stonecrop (*Sedum laxum* ssp. *eastwoodiae*)

Status: CNPS List 1 rare threatened or endangered in California or elsewhere; .2 fairly endangered in CA. No state or federal listing, State Rank S2: imperiled. Global Rank G5T2: secure.

Family: Crassulaceae

Flowering: May - July

Habitat: Lower montane coniferous forest (serpentinite)

Habitat in Project Area: Unlikely, but may occur in any serpentine outcrops

16. Siskiyou checkerbloom (*Sidalcea malviflora* ssp. *patula*)

Status: CNPS List 1 rare, threatened, or endangered in California and elsewhere; .2 fairly endangered in CA. No state or federal listing. State rank S2: imperiled. Global rank G1: imperiled.

Family: Malvaceae

Flowering: (April) May - August

Habitat: often roadcuts. Coastal bluff scrub, Coastal prairie, North Coast coniferous forest

Status within Area: Potential habitat exists around roadcuts and in forested areas.

17. Beaked tracyina (*Tracyina rostrata*)

Status: CNPS List 1 rare, threatened, or endangered; .2 fairly endangered in CA. No state or federal listing. State rank S2: imperiled; Global rank G2: imperiled.

Family: Asteraceae

Flowering: May - June

Habitat: Chaparral, Cismontane woodland, Valley and foothill grassland

Status within Area: Potential habitat exists in woodland and grassland areas.

18. Oval-leaved viburnum (*Viburnum ellipticum*)

Status: CNPS List 2 rare, threatened, or endangered in CA; .3 not very endangered in CA. No state or federal listing. State rank S3?: vulnerable. Global rank G4G5: apparently secure/secure.

Family: Adoxaceae

Flowering: May - June

Habitat: Chaparral, Cismontane woodland, Lower montane coniferous forest

Habitat in Project Area: Potential habitat exists in the woodland areas.

Attachment C. Habitat Photos

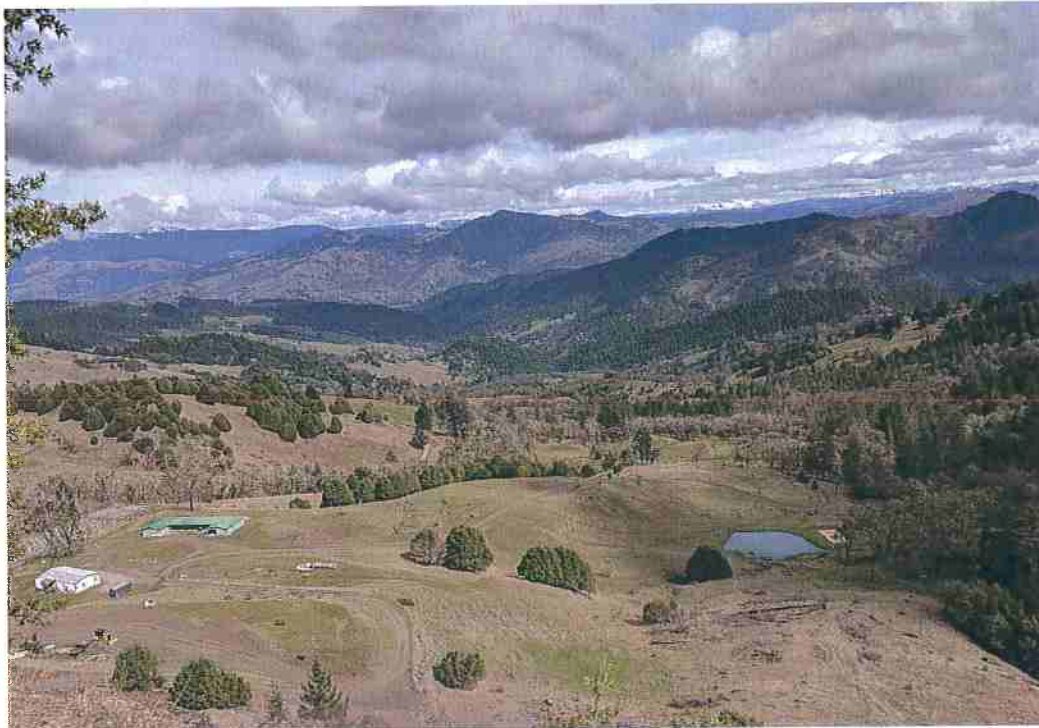


Figure 1. The cultivation area on the "Ranch Parcel" APN 216-081-013.

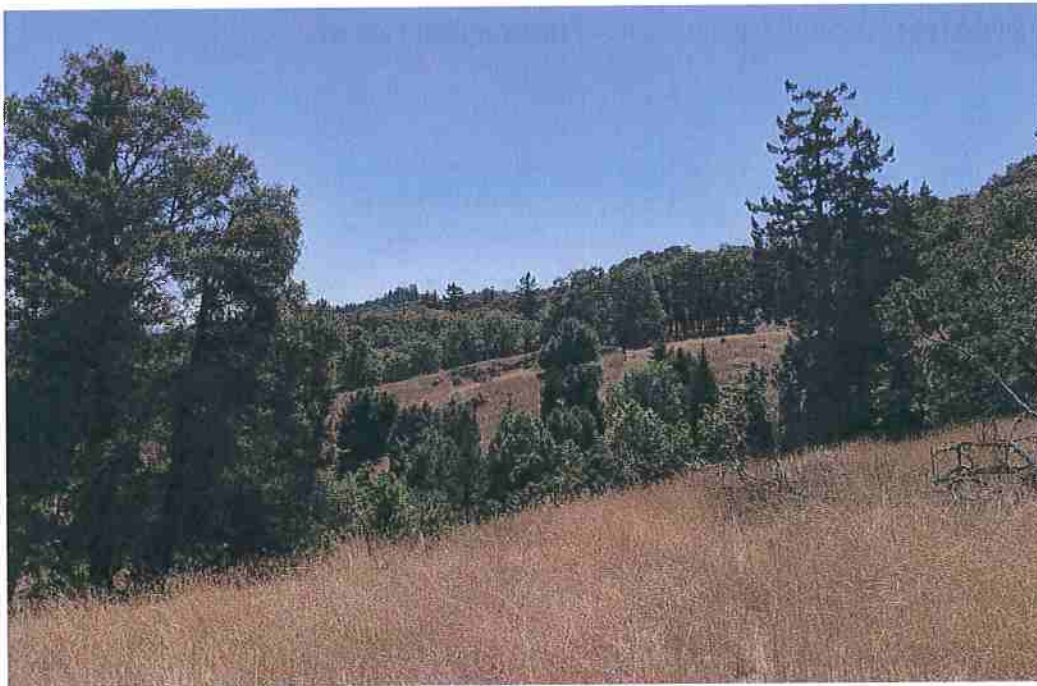


Figure 2. Grasslands and mixed oak woodlands with some Douglas fir on the "Thunder Parcel" APN 216-135-015.



Figure 3. The large in-stream pond on APN 216-135-003.

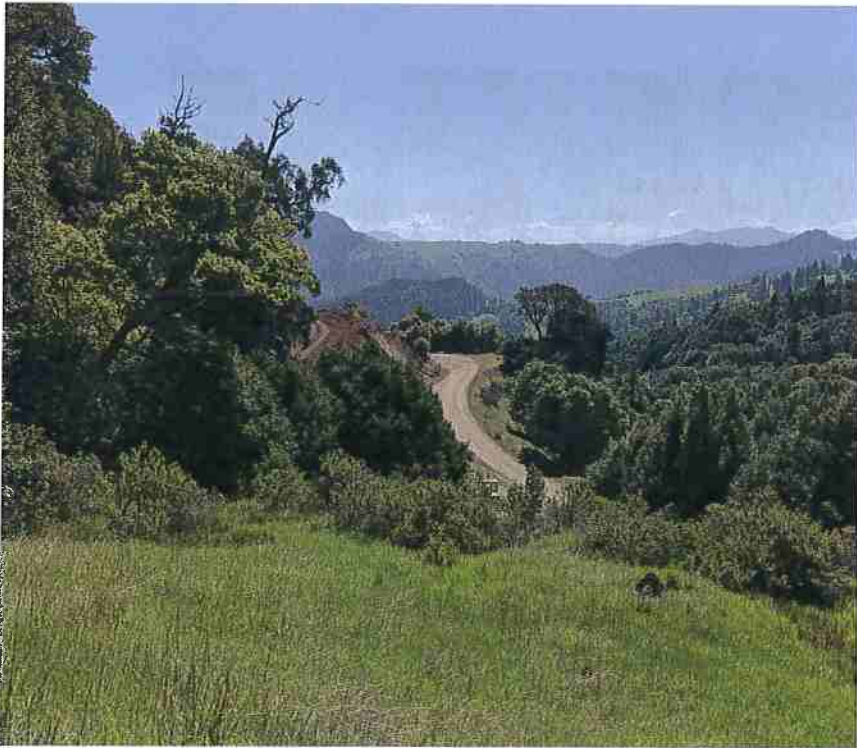


Figure 4. The quarry on APN 216-135-010.

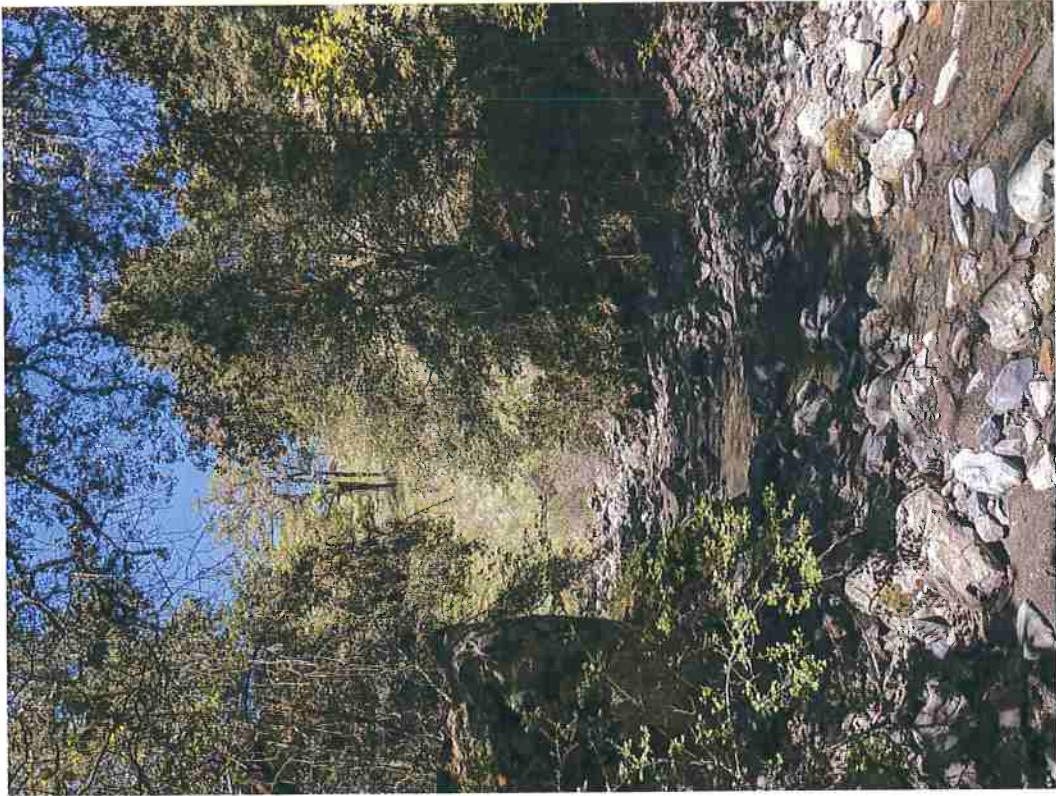


Figure 5. Riparian habitat along Perington Creek.

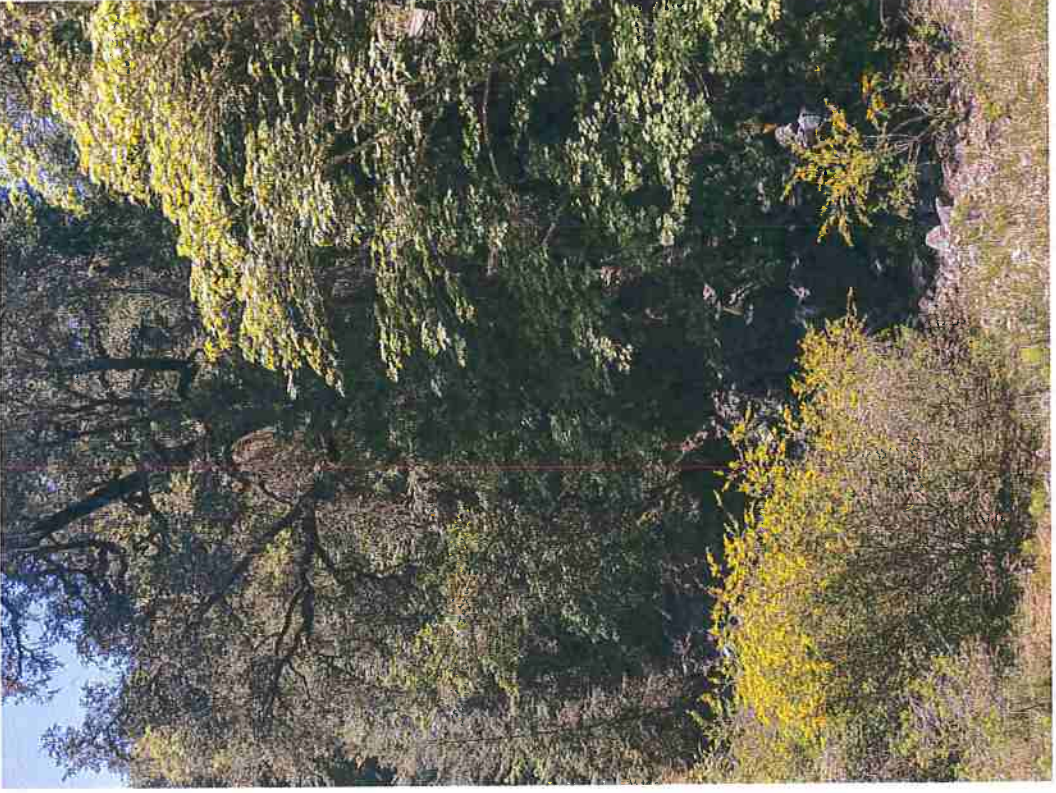


Figure 6. Invasive French broom (*Genista monspessulana*) in riparian habitat.



Figure 7. Stock pond wetland area ~60+ feet from proposed relocation area on APN 216-135-015.

Attachment D. Plant Species Observed

	Scientific Name	Common Name	Family	Status	Date
Trees	<i>Acer macrophyllum</i>	Bigleaf maple	Sapindaceae	Native	3/4/2019
	<i>Aesculus californica</i>	California buckeye	Sapindaceae	Native	4/29/2019
	<i>Arbutus menziesii</i>	Pacific madrone	Ericaceae	Native	3/4/2019
	<i>Chamaecyparis lawsoniana</i>	Port Orford cedar	Cupressaceae	Cultivated	3/4/2019
	<i>Cupressus sempervirens</i>	Italian cypress	Cupressaceae	Cultivated	3/4/2019
	<i>Fraxinus latifolia</i>	Oregon ash	Oleaceae	Native	4/29/2019
	<i>Notholithocarpus densiflorus</i>	Tanoak	Fagaceae	Native	3/4/2019
	<i>Pinus jeffreyi</i>	Jeffrey pine	Pinaceae	Native	4/29/2019
	<i>Populus fremontii</i>	Fremont cottonwood	Salicaceae	Native	6/29/2019
	<i>Pseudotsuga menziesii</i>	Douglas fir	Pinaceae	Native	3/4/2019
	<i>Quercus chrysolepis</i>	Canyon live oak	Fagaceae	Native	3/4/2019
	<i>Quercus garryana</i>	Oregon white oak	Fagaceae	Native	3/4/2019
	<i>Quercus kelloggii</i>	Kellogg's black oak	Fagaceae	Native	3/4/2019
	<i>Quercus wislizeni</i>	Interior live oak	Fagaceae	Native	9/4/2019
	<i>Salix exigua</i>	Narrowleaf willow	Salicaceae	Native	6/29/2019
	<i>Salix hookeriana</i>	Coastal willow	Salicaceae	Native	6/29/2019
<i>Umbellularia californica</i>	California bay laurel	Lauraceae	Native	3/4/2019	
Shrubs	<i>Arctostaphylos manzanita</i>	Whiteleaf manzanita	Ericaceae	Native	4/29/2019
	<i>Baccharis pilularis</i>	Coyotebrush	Asteraceae	Native	3/4/2019
	<i>Berberis aquifolium</i>	Oregon grape	Berberidaceae	Native	6/29/2019
	<i>Ceanothus integerrimus</i>	Deer brush	Rhamnaceae	Native	4/29/2019
	<i>Ceanothus thyrsiflorus</i>	Blueblossom	Rhamnaceae	Native	4/29/2019
	<i>Genista monspessulana</i>	French broom	Fabaceae	Invasive	4/29/2019
	<i>Heteromeles arbutifolia</i>	Toyon	Rosaceae	Native	4/29/2019
	<i>Holodiscus discolor</i>	Ocean spray	Rosaceae	Native	4/29/2019
	<i>Lonicera hispidula</i>	Pink honeysuckle	Caprifoliaceae	Native	4/29/2019
	<i>Lupinus albifrons</i>	Silver bush lupine	Fabaceae	Native	3/4/2019
	<i>Ribes roezlii</i> var. <i>amictum</i>	Hoary sierra gooseberry	Grossulariaceae	Native, CNPS 4.3	3/4/2019
	<i>Rosa gymnocarpa</i>	Dwarf woodland rose	Rosaceae	Native	4/29/2019
	<i>Rubus armeniacus</i>	Himalayan blackberry	Rosaceae	Invasive	4/29/2019
	<i>Rubus leucodermis</i>	White-stem raspberry	Rosaceae	Native	6/29/2019
	<i>Sambucus nigra</i>	Black elderberry	Adoxaceae	Native	4/29/2019
<i>Symphoricarpos albus</i>	Common snowberry	Caprifoliaceae	Native	4/29/2019	

	<i>Toxicodendron diversilobum</i>	Poison oak	Anacardiaceae	Native	4/29/2019
Herbaceous Layer	<i>Achillea millefolium</i>	Common yarrow	Asteraceae	Native	3/4/2019
	<i>Achyrachaena mollis</i>	Soft blow wives	Asteraceae	Native	5/9/2019
	<i>Acmispon americanus</i>	American bird's foot trefoil	Fabaceae	Native	6/29/2019
	<i>Acmispon brachycarpus</i>	Short podded lotus	Fabaceae	Native	4/29/2019
	<i>Aira caryophyllea</i>	Silver hairgrass	Poaceae	Non-native	5/9/2019
	<i>Alopecurus sp.</i>	Foxtail	Poaceae		5/9/2019
	<i>Amsinckia intermedia</i>	Common fiddleneck	Boraginaceae	Native	4/29/2019
	<i>Anaphalis margaritacea</i>	Pearly everlasting	Asteraceae	Native	4/29/2019
	<i>Anisocarpus madioides</i>	Woodland madia	Asteraceae	Native	4/29/2019
	<i>Antirrhinum vexillocalyculatum</i>	Wiry snapdragon	Plantaginaceae	Native	6/29/2019
	<i>Artemisia douglasiana</i>	California mugwort	Asteraceae	Native	4/29/2019
	<i>Asyneuma prenanthoides</i>	California harebell	Campanulaceae	Native	6/29/2019
	<i>Avena fatua</i>	Wild oat	Poaceae	Invasive	4/29/2019
	<i>Bellis perennis</i>	English daisy	Asteraceae	Non-Native	3/4/2019
	<i>Boykinia occidentalis</i>	Coastal brookfoam	Saxifagaceae	Native	4/29/2019
	<i>Briza maxima</i>	Rattlesnake grass	Poaceae	Invasive	4/29/2019
	<i>Briza minor</i>	Little quaking-grass	Poaceae	Non-native	4/29/2019
	<i>Bromus diandrus</i>	Ripgut grass	Poaceae	Invasive	4/29/2019
	<i>Bromus hordeaceus</i>	Soft chess	Poaceae	Invasive	4/29/2019
	<i>Calochortus amabilis</i>	Golden fairy lantern	Liliaceae	Native	4/29/2019
	<i>Calochortus tolmiei</i>	Hairy star tulip	Lilaceae	Native	4/29/2019
	<i>Capsella bursa-pastoris</i>	Shepherd's purse	Brassicaceae	Non-native	4/29/2019
	<i>Cardamine californica</i>	Bitter cress	Brassicaceae	Native	4/29/2019
	<i>Carduus pycnocephalus</i>	Italian thistle	Asteraceae	Invasive	4/29/2019
	<i>Carex cf. bolanderi</i>	Bolander's sedge	Cyperaceae	Native	4/29/2019
	<i>Carex cf. feta</i>	Feta sedge	Cyperaceae	Native	4/29/2019
	<i>Carex cf. harfordii</i>	Monterey sedge	Cyperaceae	Native	4/29/2019
	<i>Carex globosa</i>	Round fruit sedge	Cyperaceae	Native	4/29/2019
	<i>Castilleja attenuata</i>	Narrow leaved owl's clover	Orobanchaceae	Native	5/9/2019
	<i>Cerastium glomeratum</i>	Mouseear chickweed	Caryophyllaceae	Non-native	4/29/2019
	<i>Chlorogalum pomeridianum</i>	Soaproot	Agavaceae	Native	3/4/2019
	<i>Cirsium arvense</i>	Canada thistle	Asteraceae	Invasive	9/4/2019
<i>Cirsium occidentale</i>	Cobweb thistle	Asteraceae	Native	4/29/2019	
<i>Cirsium vulgare</i>	Bull thistle	Asteraceae	Invasive	3/4/2019	
<i>Clarkia purpurea ssp. quadrivulnera</i>	Purple clarkia	Onagraceae	Native	6/29/2019	
<i>Claytonia parviflora</i>	Narrow leaved	Montiaceae	Native	4/29/2019	

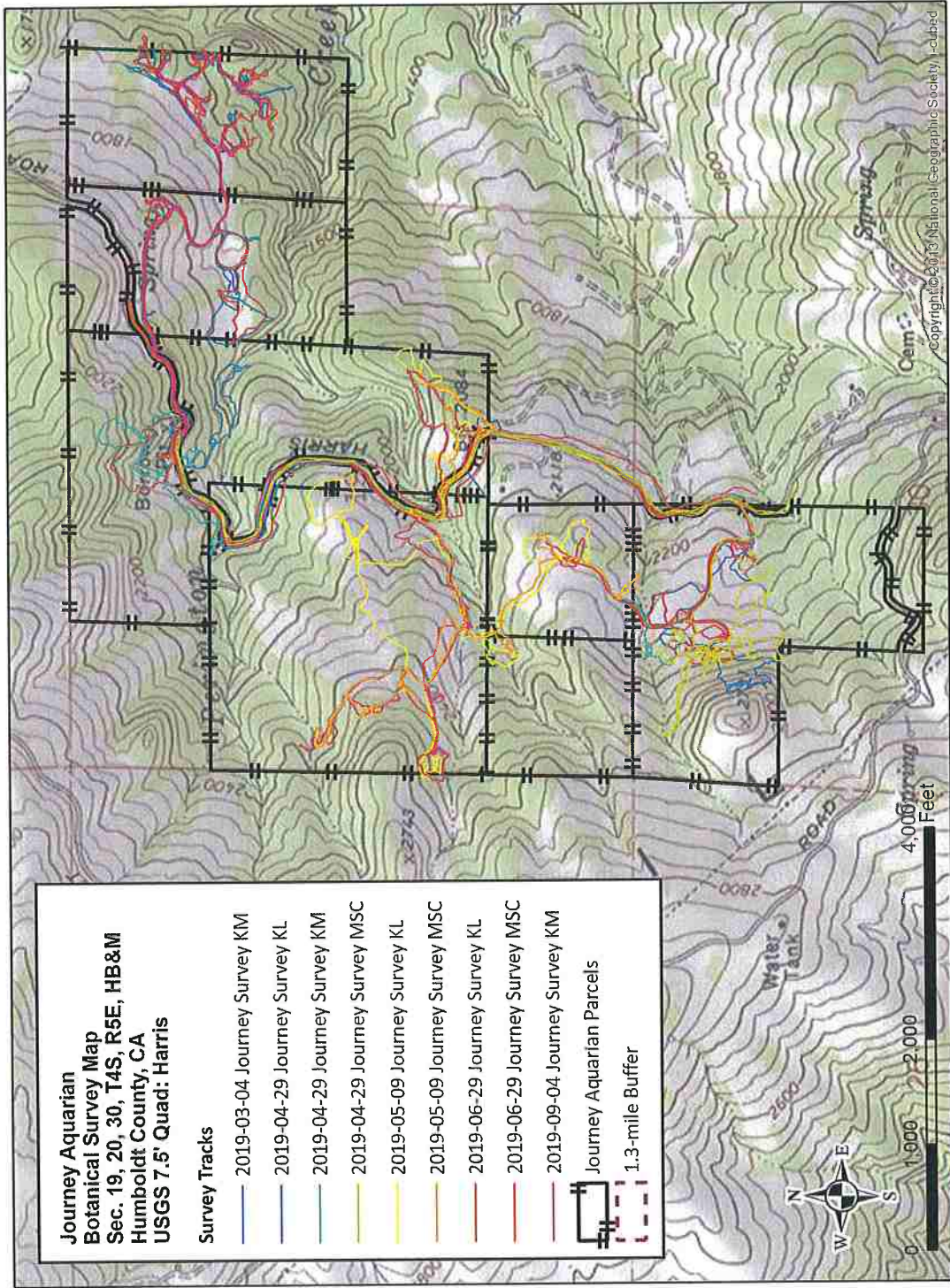
	miner's lettuce			
<i>Claytonia perfoliata</i>	Miner's lettuce	Montiaceae	Native	3/4/2019
<i>Clinopodium douglasiana</i>	Yerba buena	Lamiaceae	Native	6/29/2019
<i>Convolvulus arvensis</i>	Field bindweed	Convolvulaceae	Non-native	6/29/2019
<i>Croton setiger</i>	Turkey-mullein	Euphorbiaceae	Native	6/29/2019
<i>Cryptantha affinis</i>	Common cryptantha	Boraginaceae	Native	6/29/2019
<i>Cynoglossum grande</i>	Giant hound's tongue	Boraginaceae	Native	4/29/2019
<i>Cynosurus echinatus</i>	Hedgehog dogtail grass	Poaceae	Invasive	3/4/2019
<i>Cyperus eragrostis</i>	Tall flatsedge	Cyperaceae	Native	6/29/2019
<i>Dactylis glomerata</i>	Orchard grass	Poaceae	Invasive	3/4/2019
<i>Daucus carota</i>	Queen Anne's lace	Apiaceae	Non-native	4/29/2019
<i>Daucus pusillus</i>	American carrot	Apiaceae	Native	3/4/2019
<i>Delphinium nudicaule</i>	Canyon larkspur	Ranunculaceae	Native	4/29/2019
<i>Dichelostemma capitatum</i>	Blue dicks	Themidaceae	Native	4/29/2019
<i>Dichelostemma ida-maia</i>	Firecracker flower	Themidaceae	Native	6/29/2019
<i>Dipsacus fullonum</i>	Teasel	Dipsacaceae	Invasive	6/29/2019
<i>Dryopteris arguta</i>	Coastal wood fern	Dryopteridaceae	Native	3/4/2019
<i>Elymus glaucus</i>	Blue wild rye	Poaceae	Native	3/4/2019
<i>Epilobium ciliatum</i>	Slender willow herb	Onagraceae	Native	4/29/2019
<i>Epilobium densiflorum</i>	Dense flowered spike primrose	Onagraceae	Native	6/29/2019
<i>Equisetum arvense</i>	Common horsetail	Equisetaceae	Native	4/29/2019
<i>Equisetum laevigatum</i>	Smooth horsetail	Equisetaceae	Native	4/29/2019
<i>Eriophyllum lanatum</i>	Woolly sunflower	Asteraceae	Native	3/4/2019
<i>Erodium botrys</i>	Big heron bill	Geraniaceae	Non-Native	3/4/2019
<i>Erodium cicutarium</i>	Coastal heron's bill	Geraniaceae	Invasive	3/4/2019
<i>Erythranthe guttata</i>	Yellow monkey flower	Phrymaceae	Native	4/29/2019
<i>Erythronium californicum</i>	California fawn lily	Lilaceae	Native	5/9/2019
<i>Eschscholzia californica</i>	California poppy	Papaveraceae	Native	3/4/2019
<i>Festuca californica</i>	California fescue	Poaceae	Native	3/4/2019
<i>Festuca perennis</i>	Perennial rye grass	Poaceae	Invasive	6/29/2019
<i>Foeniculum vulgare</i>	Sweet fennel	Apiaceae	Invasive	6/29/2019
<i>Fragaria vesca</i>	Woodland strawberry	Rosaceae	Native	4/29/2019
<i>Fritillaria affinis</i>	Checker lily	Lilaceae	Native	4/29/2019
<i>Galium aparine</i>	Common bedstraw	Rubiaceae	Native	4/29/2019
<i>Geranium dissectum</i>	Cut leaved geranium	Geraniaceae	Invasive	4/29/2019
<i>Geranium molle</i>	Crane's bill geranium	Geraniaceae	Non-Native	3/4/2019
<i>Hemizonia congesta</i>	Hayfield tarweed	Asteraceae	Native	5/9/2019
<i>Hieracium albiflorum</i>	White flowered	Asteraceae	Native	4/29/2019

	hawkweed			
<i>Hordeum murinum</i>	Foxtail barley	Poaceae	Invasive	4/29/2019
<i>Hypericum anagalloides</i>	Creeping St. John's wort	Hypericaceae	Native	6/29/2019
<i>Hypericum perforatum</i>	Klamathweed	Hypericaceae	Invasive	3/4/2019
<i>Hypochaeris radicata</i>	Hairy cat's ear	Asteraceae	Invasive	3/4/2019
<i>Iris purdyi</i>	Purdy's iris	Iridaceae	Native	4/29/2019
<i>Juncus effusus</i>	Common bog rush	Juncaceae	Native	3/4/2019
<i>Juncus patens</i>	Spreading rush	Juncaceae	Native	3/4/2019
<i>Juncus torreyi</i>	Torrey's rush	Junicaceae	Native	6/29/2019
<i>Lactuca serriola</i>	Prickly lettuce	Asteraceae	Non-Native	3/4/2019
<i>Lasthenia californica</i>	California goldfields	Asteraceae	Native	4/29/2019
<i>Lathyrus vestitus</i>	Common pacific pea	Fabaceae	Native	4/29/2019
<i>Leontodon saxatilis</i>	Hawkbit	Asteraceae	Non-native	4/29/2019
<i>Leptosiphon bicolor</i>	True babystars	Polemoniaceae	Native	4/29/2019
<i>Limnanthes douglasii</i>	Common meadowfoam	Limnathaceae	Native	4/29/2019
<i>Linum bienne</i>	Narrow leaved flax	Linaceae	Non-native	4/29/2019
<i>Lithophragma affine</i>	Common woodland star	Saxifragaceae	Native	5/9/2019
<i>Lomatium utriculatum</i>	Bladder parsnip	Apiaceae	Native	5/9/2019
<i>Lupinus bicolor</i>	Miniature lupine	Fabaceae	Native	3/4/2019
<i>Lysimachia arvensis</i>	Scarlet pimpernel	Myrsinaceae	Non-native	4/29/2019
<i>Lysimachia latifolia</i>	Pacific starflower	Myrsinaceae	Native	4/29/2019
<i>Madia exigua</i>	Little tarweed	Asteraceae	Native	6/29/2019
<i>Madia gracilis</i>	Gumweed	Asteraceae	Native	6/29/2019
<i>Matricaria discoidea</i>	Pineapple weed	Asteraceae	Native	4/29/2019
<i>Medicago polymorpha</i>	Burr clover	Fabaceae	Invasive	4/29/2019
<i>Mentha pulegium</i>	Pennyroyal	Lamiaceae	Invasive	3/4/2019
<i>Micranthes californica</i>	Greene's saxifrage	Saxifagaceae	Native	4/29/2019
<i>Monardella sheltonii</i>	Shelton's coyote mint	Lamiaceae	Native	6/29/2019
<i>Montia fontana</i>	Water montia	Montiaceae	Native	3/4/2019
<i>Myosotis discolor</i>	Yellow and blue forget-me-not	Boraginaceae	Non-native	4/29/2019
<i>Narcissus pseudonarcissus</i>	Daffodil	Amaryllidaceae	Non-Native	3/4/2019
<i>Nasturtium officinale</i>	Watercress	Brassicaceae	Native	3/4/2019
<i>Navarretia intertexta</i>	Needleleaf navarretia	Polemanaceae	Native	6/29/2019
<i>Nemophila menziesii</i>	Baby blue eyes	Boraginaceae	Native	3/4/2019
<i>Osmorhiza berteroi</i>	Sweet cicely	Apiaceae	Native	4/29/2019
<i>Parentucellia viscosa</i>	Yellow glandweed	Orobanchaceae	Non-native	6/29/2019
<i>Pedicularis densiflora</i>	Indian warrior	Orobanchaceae	Native	4/29/2019
<i>Penstemon heterophyllus</i>	Bunchleaf	Plantaginaceae	Native	6/29/2019

	penstemon			
<i>Pentagramma triangularis</i>	Goldback fern	Pteridaceae	Native	3/4/2019
<i>Petrorhagia dubia</i>	Windmill pink	Caryophyllaceae	Non-native	6/29/2019
<i>Phacelia corymbosa</i>	Serpentine phacelia	Boraginaceae	Native	6/29/2019
<i>Phalaris aquatica</i>	Harding grass	Poaceae	Invasive	4/29/2019
<i>Phoradendron leucarpum</i>	American mistletoe	Viscaceae	Native	3/4/2019
<i>Piperia transversa</i>	Mountain piperia	Orchidaceae	Native	6/29/2019
<i>Plagiobothrys nothofulvus</i>	Rusty haired popcorn flower	Boraginaceae	Native	4/29/2019
<i>Plagiobothrys tenellus</i>	Pacific popcornflower	Boraginaceae	Native	6/29/2019
<i>Plantago lanceolata</i>	English plantain	Plantaginaceae	Invasive	3/4/2019
<i>Plectritis congesta</i>	Sea blush	Valerianaceae	Native	5/9/2019
<i>Poa pratensis</i>	Kentucky blue grass	Poaceae	Invasive	9/4/2019
<i>Polygala californica</i>	California milkwor	Polygalaceae	Native	6/29/2019
<i>Polypodium glycyrrhiza</i>	Licorice fern	Polypodiaceae	Native	3/4/2019
<i>Polypogon australis</i>	Chilean beard grass	Poaceae	Non-native	9/4/2019
<i>Polystichum imbricans</i>	Narrow leaved sword fern	Dryopteridaceae	Native	3/4/2019
<i>Polystichum munitum</i>	Western swordfern	Dryopteridaceae	Native	4/29/2019
<i>Primula jeffreyi</i>	Sierra shooting star	Primulaceae	Native	4/29/2019
<i>Prosartes hookeri</i>	Drops of gold	Liliaceae	Native	4/29/2019
<i>Pseudognaphalium californicum</i>	Ladies' tobacco	Asteraceae	Native	6/29/2019
<i>Pseudognaphalium sp.</i>	Cudweed	Asteraceae	Native	4/29/2019
<i>Pteridium aquilinum</i>	Western brackenfern	Dennstaedtiaceae	Native	3/4/2019
<i>Pyrola aphylla</i>	Leafless wintergreen	Ericaceae	Native	6/29/2019
<i>Ranunculus hebecarpus</i>	Delicate buttercup	Ranunculaceae	Native	4/29/2019
<i>Ranunculus muricatus</i>	Spinyfruit buttercup	Ranunculaceae	Non-native	5/9/2019
<i>Ranunculus occidentalis</i>	Western buttercup	Ranunculaceae	Native	4/29/2019
<i>Rumex acetosella</i>	Sheep sorrel	Polygonaceae	Invasive	3/4/2019
<i>Rumex crispus</i>	Curly dock	Polygonaceae	Invasive	3/4/2019
<i>Sanicula bipinnatifida</i>	Purple sanicle	Apiaceae	Native	4/29/2019
<i>Sanicula crassicaulis</i>	Pacific sanicle	Apiaceae	Native	3/4/2019
<i>Saxifraga mertensiana</i>	Wood saxifrage	Saxifagaceae	Native	4/29/2019
<i>Schoenoplectus americanus</i>	Olney's three-square bulrush	Cyperaceae	Native	9/4/2019
<i>Scutellaria antirrhinoides</i>	Snapdragon skullcap	Lamiaceae	Native	6/29/2019
<i>Sherardia arvensis</i>	Field madder	Rubiaceae	Non-native	6/29/2019
<i>Sidalcea diploscypha</i>	Fringed sidalcea	Malvaceae	Native	6/29/2019
<i>Silene laciniata</i>	Cardinal catchfly	Caryophyllaceae	Native	6/29/2019
<i>Silybum marianum</i>	Milk thistle	Asteraceae	Invasive	3/4/2019

<i>Sisyrinchium bellum</i>	Western blue eyed grass	Iridaceae	Native	4/29/2019
<i>Spergularia rubra</i>	Purple sand spurry	Caryophyllaceae	Non-native	6/29/2019
<i>Spiranthes romanzoffiana</i>	Hooded ladies tresses	Orchidaceae	Native	6/29/2019
<i>Stachys rigida</i>	Rigid hedgenettle	Lamiaceae	Native	6/29/2019
<i>Stellaria media</i>	Chickweed	Caryophyllaceae	Native	3/4/2019
<i>Taraxacum officinale</i>	Dandelion	Asteraceae	Non-native	5/9/2019
<i>Toxicoscordion micranthum</i>	Small flowered star lily	Melanthiaceae	Native	5/9/2019
<i>Trachycarpus fortunei</i>	Mindmill palm (cultivated)	Arecaceae	Non-native	4/29/2019
<i>Tragopogon dubius</i>	Yellow salsify	Asteraceae	Non-native	6/29/2019
<i>Trifolium albopurpureum</i>	Indian clover	Fabaceae	Native	4/29/2019
<i>Trifolium fucatum</i>	Bull clover	Fabaceae	Native	4/29/2019
<i>Trifolium incarnatum</i>	Crimson clover	Fabaceae	Non-native	5/9/2019
<i>Trifolium subterraneum</i>	Subterranean clover	Fabaceae	Native	4/29/2019
<i>Trifolium willdenovii</i>	Tomcat clover	Fabaceae	Native	4/29/2019
<i>Trillium albidum</i>	Giant white wakerobin	Melanthiaceae	Native	4/29/2019
<i>Trillium ovatum</i>	Pacific trillium	Melanthiaceae	Native	4/29/2019
<i>Triteleia laxa</i>	Ithuriel's spear	Themidaceae	Native	6/29/2019
<i>Typha latifolia</i>	Common cattail	Typhaceae	Native	6/29/2019
<i>Urtica urens</i>	Dwarf nettle	Urticaceae	Non-native	4/29/2019
<i>Vancouveria planipetala</i>	Inside out flower	Berberidaceae	Native	6/29/2019
<i>Vicia americana</i>	American vetch	Fabaceae	Native	4/29/2019
<i>Vicia hirsuta</i>	Hairy vetch	Fabaceae	Non-native	4/29/2019
<i>Vicia sativa</i>	Garden vetch	Fabaceae	Non-native	4/29/2019
<i>Viola ocellata</i>	Pinto violet	Violaceae	Native	4/29/2019
<i>Woodwardia fimbriata</i>	Giant chain fern	Blechnaceae	Native	3/4/2019
<i>Zeltnera muehlenbergii</i>	Muehlenberg's centaury	Gentianaceae	Native	6/29/2019

Attachment E. Botanical Survey Map



Attachment F. Rank Definitions

Global Conservation Status Definition

Listed below are definitions for interpreting NatureServe global (range-wide) conservation status ranks. These ranks are assigned by NatureServe scientists or by a designated lead office in the NatureServe network.

- 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 or elimination due to very restricted range, very few populations, steep declines, or other factors.
- G3** **Vulnerable** – At moderate risk of extinction or elimination due to a restricted range, relatively few populations, 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.
- G#G#** **Range Rank** – A numeric range rank (e.g. G2G3, G1G3) is used to indicate the range of uncertainty about the exact status of a taxon or ecosystem type. Ranges cannot skip more than two ranks (e.g., GU should be used rather than G1G4).

Intraspecific Taxon Conservation Status Ranks

- T#** **Intraspecific Taxon** (trinomial) – The status of intraspecific taxa (subspecies or varieties) are indicated by a “T-rank” following the species global rank. Rules for assigning T-ranks follow the same principles outlined above. For example, the global rank of a critically imperiled subspecies of an otherwise widespread and common species would be G5T1. A T subrank cannot imply the subspecies or variety is more abundant than the species. For example, a G1T2 subrank should not occur. A vertebrate animal population, (e.g., listed under the U.S. Endangered Species Act or assigned candidate status) may be tracked as an intraspecific taxon and given a T-rank; in such cases a Q is used after the T-rank to denote the taxon’s informal taxonomic status.

Subnational (S) Conservation Status Ranks

- S1** **Critically Imperiled** – Critically imperiled in the jurisdiction because of extreme rarity or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the jurisdiction.
- S2** **Imperiled** – Imperiled in the jurisdiction because of rarity due to very restricted range, very few populations, steep declines, or other factors making it very vulnerable to extirpation from jurisdiction.
- S3** **Vulnerable** – Vulnerable in the jurisdiction due to a restricted range, relatively few populations, 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 jurisdiction.
- S#S#** **Range Rank** – A numeric range rank (e.g., S2S3 or S1S3) is used to indicate any range of uncertainty about the status of the species or ecosystem. Ranges cannot skip more than two ranks (e.g., SU is used rather than S1S4).

Rank Qualifiers

- ?** **Inexact Numeric Rank** – Denotes inexact numeric rank; this should not be used with any of the Variant Global Conservation Status
- Q** **Questionable taxonomy that may reduce conservation priority** – Distinctiveness of this entity as a taxon or ecosystem type at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon or type in another taxon or type, with the resulting taxon having a

lower-priority (numerically higher) conservation status rank. The “Q” modifier is only used at a global level and not at a national or subnational level.

The California Rare Plant Ranks

- 1A. Presumed extirpated in California and either rare or extinct elsewhere
- 1B. Rare or Endangered in California and elsewhere
- 2A. Presumed extirpated in California, but more common elsewhere
- 2B. Rare or Endangered in California, but more common elsewhere
- 3. Plants for which we need more information – Review list
- 4. Plants of limited distribution – Watch list

1A: Plants Presumed Extirpated in California and either rare or extinct elsewhere

The plants of Rank 1A are presumed extirpated because they have not been seen or collected in the wild in California for many years. This rank includes those plant taxa that are both presumed extinct, as well as those plants which are presumed extirpated in California and rare elsewhere. A plant is extinct if it no longer occurs anywhere. A plant that is extirpated from California has been eliminated from California, but may still occur elsewhere in its range.

1B: Plants Rare, Threatened or Endangered in California and Elsewhere (Includes Rare Plant Ranks 1B.1, 1B.2, 1B.3)

The plants of Rank 1B are rare throughout their range with the majority of them endemic to California. Most of the plants that are ranked 1B have declined significantly over the last century. California Rare Plant Rank 1B plants constitute the majority of plant taxa tracked by the CNDDDB, with more than 1,000 plants assigned to this category of rarity.

2A: Plants Presumed Extirpated in California, but more common elsewhere

The plants of Rank 2A are presumed extirpated because they have not been seen or collected in the wild in California for many years. This rank includes only those plant taxa that are presumed extirpated in California, but that are more common elsewhere in their range. Note: Plants of both Rank 1A and 2A are presumed extirpated in California; the only difference is the status of the plants outside of the state.

2B: Plants Rare, Threatened or Endangered in California, but More Common Elsewhere (Includes Rare Plant Ranks 2B.1, 2B.2 2B.3)

The plants of Rank 2B are rare, threatened or endangered in California, but more common elsewhere. Plants common in other states or countries are not eligible for consideration under the provisions of the Federal Endangered Species Act; however they are eligible for consideration under the California Endangered Species Act. This rank is meant to highlight the importance of protecting the geographic range and genetic diversity of more widespread species by protecting those species whose ranges just extend into California. Note: Plants of both Rank 1B and 2B are rare, threatened or endangered in California; the only difference is the status of the plants outside of the state.

Threat Ranks:

The California Rare Plant Ranks (CRPR) use a decimal-style threat rank. The threat rank is an extension added onto the CRPR and designates the level of threats by a 1 to 3 ranking with 1 being the most threatened and 3 being the least threatened. So most CRPRs read as 1B.1, 1B.2, 1B.3, etc. Note that some Rank 3 plants do not have a threat code extension since there are no known extant populations of the plants in California.

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 of immediacy of threat or no current threats known)