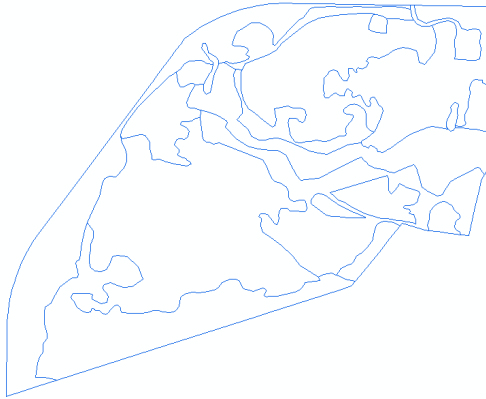


Clay Pit SVRA

Vegetation Mapping Report 2021

California State Parks



Credits:

[Melissa Patten](#), Natural Resources Division
fieldwork, data analysis, report
[Leah Gardner](#), Natural Resources Division
fieldwork, data analysis

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Link to GIS data files

[Finescale Vegetation Mapping at the SVRAs \(arcgis.com\)](#)

Introduction

Goals and Purpose

This finescale vegetation map for Clay Pit SVRA was developed by California State Park staff in 2021. Its development was prompted by the passage of Senate Bill 249, in which California Department of Parks and Recreation’s Off-Highway Motor Vehicle Recreation Division (OHMVRD) was charged with meeting new legislative mandates to ensure resources compliance within all State Vehicular Recreation Areas (SVRAs). These mandates require (among other things) that OHMVRD compile an inventory of native plant communities within each SVRA [PRC 5090.35 (c)(1)]. To meet this requirement, OHMVRD has consulted the California Department of Fish and Wildlife’s Vegetation Classification and Mapping Program (VegCAMP) to source finescale vegetation maps that cover the SVRA footprint, or, if not available, used the VegCAMP methods to develop a new finescale vegetation map.

The finescale vegetation map and associated data is intended to provide an inventory of native plant communities, inform the park's natural resource management planning including the Wildlife Habitat Protection Plan (WHPP), and establish a baseline for measuring future vegetation change.

Summary of Vegetation Mapping Effort

Spring 2021	Conduct field surveys to sample vegetation types
Fall 2021	Finalize vegetation types, conduct linework, and finalize map

Description of Clay Pit SVRA

Clay Pit SVRA is a small, 220-acre park in unincorporated Butte County, three miles southwest of Oroville. It consists of a narrow terrace surrounding a large bowl-shaped depression that was excavated for clay substrate to use in the construction of the Oroville Dam. It was a popular unofficial off-highway vehicle (OHV) riding area, and became an SVRA in 1981. The entire park is designated as open riding, except for an exclusion zone where a drainage canal flows through the park and into the Feather River oxbow. The park frequently floods from rainfall in wet months, and dries out in the summer. Because of the clay substrate, the shallow depressions formed from OHV use create vernal pools in the spring, providing habitat for native vernal pool plant species and branchiopod species. However, due to the history of disturbance and lack of original topography, many species at the park are ruderal non-natives.

Methods

Existing data

Clay Pit SVRA is covered by the Great Valley Ecoregion VegCAMP project (Buck-Diaz et al., 2012), however, the map shows the park as a single grassland polygon. More detail is needed for this project, so State Park staff conducted surveys and linework for the park.

Fieldwork

Field visits were conducted on April 15th, May 12th, and May 27th, 2021 in order to sample vegetation and capture the range of vernal pool species present. Three reconnaissance samples were taken (see Appendix D) and informal notes were made while walking the entire park.

Data interpretation and linework

The vegetation classification for the Great Valley EcoRegion (Buck-Diaz et al., 2012) was used to key out vegetation alliances. However, because the park's topography is both artificial and subject to interannual variation due to OHV use, the depressions that form vernal pool habitat are often quite small and change location from year to year. Additionally, the upland grassland vegetation is patchy and various in species composition on a scale that is impractical to map. Therefore, the majority of the herbaceous area of the park is mapped as a "vernal pool grassland matrix". Alliances and species found while surveying are described below.

Linework followed the mapping standards found in the "Survey of California Vegetation Classification and Mapping Standards"(CDFW b) as much as possible. The minimum mapping unit

was 1 acre, and ¼ acre for wetland or special types, which at the park includes only two small riparian stands and one patch of perennial grassland. The herbaceous stands that compose most of the park were split according to cover, but there was no maximum mapping unit size. No accuracy assessment was done because almost all polygons were visited in the field.

Vegetation Types and Descriptions

Grassland and Vernal Pool Matrix

This mapping unit comprises 216 acres of the 220-acre park. It is characterized by degraded annual grassland, with small vernal pools scattered throughout. Typically, this vegetation is sparse because of the rocky soils exposed by historic placer mining and clay soil extraction activities. It consists primarily of non-native ruderal species adapted to disturbance, although some native species are present. Numerous OHV trails traverse the degraded annual grassland habitat creating large swaths of bare ground throughout the SVRA. The grassland vegetation types are within the “California Annual and Perennial Grassland” macro group. A few scattered solitary Fremont cottonwood (*Populus fremontii*) and valley oak (*Quercus lobata*) trees occur throughout.

In the terraced area along the northern and western edges of the park (approximately 27 acres), the grassland is dominated by non-native species, generally fitting the *Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance. The topography is undulating, with hummocked mounds formed by excavation activity. Dominant species include *Elymus caput-medusae*, *Avena* spp., *Briza maxima*, *Aegilops triuncialis*, and *Bromus hordeaceus*. Overall plant cover is higher in the terraced area than in the rest of the park. Native species are present, though at low cover, including *Dichelostemma multiflorum* and *Calycadenia spicata*. Yellow starthistle (*Centaurea solstitialis*) occurs in narrow stands along Larkin Road and along the north end of the intermittent drainage.

In the non-terraced basin area (approximately 189 acres), grasslands are similarly dominated by non-native annual species, including *Bromus hordeaceus*, *Bromus rubens*, *Avena* spp., and *Festuca perennis*. Notably, *Elymus caput-medusae* (medusahead grass) and *Aegilops triuncialis* (barb goatgrass) do not have a significant presence in the pit area. Herbaceous cover tends to be lower throughout the basin area than in the terraced area. The most common alliances in the basin area grassland are *Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance, *Bromus rubens* – *Schismus (arabicus, barbatus)* Herbaceous Semi-Natural Alliance, and *Lolium perenne* (also called *Festuca perennis*) Herbaceous Semi-Natural Alliance. Additionally, several perennial grassland alliances are found in small patches throughout the pit area, including the *Grindelia (camporum, stricta)* Provisional Herbaceous Alliance, characterized at the park by *Grindelia camporum*, and the *Eriogonum (elongatum, nudum)* Herbaceous Alliance, characterized at the park by *Eriogonum nudum*. These alliances are patchy throughout the pit area and lack distinctive boundaries, and so are not delineated in the map.

Vernal pool species assemblages are present throughout this mapping unit, in both the terraced area and the basin area. The vernal pools at the SVRA are considered northern hardpan vernal pools due to SVRA’s location within the Northeastern Sacramento Valley Vernal Pool Region of California and the presence of iron-silica cemented soils on the site.

Field surveys of the vernal pools found the same assemblage throughout the site: the *Lasthenia fremontii*- *Downingia (bicornuta)* Herbaceous Alliance. At Clay Pit, this alliance is characterized mostly by native species, including *Eryngium castrense*, *Lasthenia fremontii*, *Downingia bicornuta*, *Navarretia leucocephala*, *Psilocarphus brevissimus*, *Plagiobothrys stipitatus*, *Deschampsia danthonoides*, *Eleocharis macrostachya*, and *Alopecurus saccatus*.

California Perennial Grassland

There is a small half-acre stand of the native perennial bunchgrass *Aristida ternipes* var. *gracilis* on a south-facing slope in the northern part of the park. This species grows in dense, tufted, perennial bunches that are visually distinct from the annual grasses in the rest of the park. It is unknown how this species came to be at the park. There is no alliance or association classification for an assemblage dominated by this species, and therefore this stand has been mapped at the group level as a California Perennial Grassland.

Fremont Cottonwood (*Populus fremontii*) Association

There is a small stand (0.4 acres) of Fremont cottonwood (*Populus fremontii*) in the center of the park, with no shrub layer and a similar herb layer to the surrounding grassland. It has been mapped as the *Populus fremontii* Association.

Arroyo Willow (*Salix lasiolepis*) Shrubland Alliance

This narrow half-acre stand of riparian shrubs grows along the intermittent drainage near Larkin Road. It consists of a few arroyo willows (*Salix lasiolepis*) and one blue elderberry (*Sambucus nigra* ssp. *caerulea*).

Developed

This unvegetated mapping unit is designated for the paved road and gravel parking lot.

References

Link to GIS data files

Finescale Vegetation Mapping at the SVRAs (arcgis.com)

Buck-Diaz, J., S. Batiuk, and J. M. Evens. 2012. Vegetation Alliances and Associations of the Great Valley Ecoregion, California. California Native Plant Society. Available at <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=64011&inline>

CDFW a. "Combined Vegetation Rapid Assessment and Relevé Field Form". Available at <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18598&inline>

CDFW b. "Survey of California Vegetation Classification and Mapping Standards" Available at

<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=102342&inline>

CDFW-CNPS. "CDFW-CNPS Protocol for the Combined Vegetation Rapid Assessment and Relevé Field Form" Available at: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18599&inline>

Appendices

Appendix A: Map Figures



Figure 1: Clay Pit SVRA vegetation community map, 2021

Appendix B: Field datasheets

RECON FIELD FORM (March 6, 2019, with slope/aspect)

Recorder: <u>Melissa Patten</u>		Other Surveyors: _____		Date: <u>4-15-21</u> Return? <input type="checkbox"/>	
Waypoint ID: <u>CP001</u>		GPS Name <u>MVP Phone</u> Projected? <u>(No)</u> / Yes / Base / Digitized			
UID:		If Yes, enter: Bearing (°): _____ Distance (m): _____ Inclination (°): _____			
Location Name: <u>Clay Pit + SVRA</u>		If Yes or Digitized, enter: Base Waypoint ID: _____			
		Base / Projected (circle one) Record either UTM's or Decimal Degrees GPS error: <u>6</u> m / PDOP <u>1.9</u>			
		UTMs: UTM _____ UTMN _____			
		Decimal degrees: LAT <u>39.482345</u> LONG <u>-121.615946</u>			
Stand Size: <u>(1)</u> 1-5 >5		Camera: <u>MVP</u> Photos: <u>2N</u> <u>pub</u> <u>plnt</u> <u>photos</u>		View Radius <u>300</u> m	
Exposure, Actual °: _____ NE NW SE SW <u>(Flat)</u> Variable Steepness, Actual °: _____ <u>(0°)</u> 1-5° >5-25° >25					
Field Alliance name: <u>Lasthenia fremontii - Downingia (bicornuta) Herbaceous Alliance</u>					
Comments: <u>vernal pool visible in imagery. In photos, bright green characterized by Eryngium sp. + gold fields along border. Dry but others in area w/ same species (but smaller) are wet. Lots of bare ground, cracked clay</u>					
% Cover: Conifer		Hardwood		Total Tree	
Strata	Species	% cover	Strata	Species	% cover
H	<u>Eryngium</u> <u>sp.</u>	<u>3</u>	H	<u>Sedge</u> <u>sp.</u>	<u>1</u>
H	<u>Plant</u> <u>crypt.</u> <u>sp.</u>	<u>1</u>	H	<u>Grass</u> <u>/</u> <u>Alopecurus</u> <u>Plantago</u> <u>saccharatus</u>	<u><1</u>
H	<u>P. locarphus</u> <u>sp.</u> <u>brevissimus</u>	<u>1</u>	H	<u>Downingia</u> <u>sp.</u> <u>bicornuta</u>	<u>1</u>
H	<u>Lasthenia</u> <u>fremontii</u>	<u>2</u>	H	<u>Navarretia</u> <u>sp.</u> <u>leucophylla</u>	<u>1</u>
			Total Veg		Exotics (L,M,H)
Strata	Species	% cover	Strata	Species	% cover
H	<u>L. bicolor</u>	<u>1</u>	H	<u>Trifolium</u> <u>sp.</u>	<u><1</u>
H	<u>Deschampsia</u> <u>anthoniodes</u>	<u><1</u>			

RECON FIELD FORM (March 6, 2019, with slope/aspect)

Recorder:		Other Surveyors: MP, LG		Date: 5-12-21 Return? <input type="checkbox"/>																																																													
Waypoint ID: CP-002	GPS Name _____ Projected? No / Yes / Base / Digitized If Yes, enter: Bearing (°): _____ Distance (m): _____ Inclination (°): _____ If Yes or Digitized, enter: Base Waypoint ID: _____ Base / Projected (circle one) Record either UTM's or Decimal Degrees GPS error: (ft./m.) PDOP 19 UTM's: UTME _____ UTMN _____ Decimal degrees: LAT 39.481367 LONG - 121.613999																																																																
Location Name:																																																																	
Stand Size: <1 1-5 >5	Camera:	Photos:	View Radius 30m																																																														
Exposure, Actual °: _____ NE NW SE SW Flat Variable Steepness, Actual °: _____ 0° 1-5° >5-25° >25																																																																	
Field Alliance name:																																																																	
Comments: upland surrounding "venal pool" low spots. Dominated by Grindelia + non-native grasses mostly Italian ryegrass. Recently fenced off, but still highly disturbed. Present on flats throughout																																																																	
<table border="1"> <thead> <tr> <th colspan="2">% Cover: Conifer</th> <th>Hardwood</th> <th>Total Tree</th> <th>Regen Tree</th> <th>Shrub</th> <th>Herb</th> <th>Total Veg</th> <th colspan="2">Exotics (L,M,H)</th> </tr> <tr> <th>Strata</th> <th>Species</th> <th>% cover</th> <th>Strata</th> <th>Species</th> <th>% cover</th> <th>Strata</th> <th>Species</th> <th>% cover</th> <th>% cover</th> </tr> </thead> <tbody> <tr> <td></td> <td>Grindelia camporum</td> <td>6</td> <td></td> <td>Trifolium</td> <td><1</td> <td></td> <td>Elymus</td> <td>Capit-medusae</td> <td>r</td> </tr> <tr> <td></td> <td>Festuca perennis</td> <td>17</td> <td></td> <td>Achillea sp.</td> <td>r</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>Avena sp.</td> <td>1</td> <td></td> <td>(not included in Eryngium low spots)</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>Centaurea</td> <td>r</td> <td></td> <td>Thymus glabra</td> <td><1</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>						% Cover: Conifer		Hardwood	Total Tree	Regen Tree	Shrub	Herb	Total Veg	Exotics (L,M,H)		Strata	Species	% cover	Strata	Species	% cover	Strata	Species	% cover	% cover		Grindelia camporum	6		Trifolium	<1		Elymus	Capit-medusae	r		Festuca perennis	17		Achillea sp.	r						Avena sp.	1		(not included in Eryngium low spots)							Centaurea	r		Thymus glabra	<1				
% Cover: Conifer		Hardwood	Total Tree	Regen Tree	Shrub	Herb	Total Veg	Exotics (L,M,H)																																																									
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	Festuca perennis	17		Achillea sp.	r																																																												
	Avena sp.	1		(not included in Eryngium low spots)																																																													
	Centaurea	r		Thymus glabra	<1																																																												

RECON FIELD FORM (March 6, 2019, with slope/aspect)

Recorder:		Other Surveyors: MP LG		Date: 5-12-21 Return? <input type="checkbox"/>																																																													
Waypoint ID: CP003	GPS Name _____ Projected? No / Yes / Base / Digitized If Yes, enter: Bearing (°): _____ Distance (m): _____ Inclination (°): _____ If Yes or Digitized, enter: Base Waypoint ID: _____ Base / Projected (circle one) Record either UTM's or Decimal Degrees GPS error: ft./m./ PDOP _____ UTM's: UTME _____ UTMN _____ Decimal degrees: LAT _____ LONG - _____																																																																
Location Name:																																																																	
Stand Size: <1 1-5 >5	Camera:	Photos:	View Radius _____																																																														
Exposure, Actual °: _____ NE NW SE SW Flat Variable Steepness, Actual °: _____ 0° 1-5° >5-25° >25																																																																	
Field Alliance name:																																																																	
Comments: Hummocky, non-native grassland. Looking for evidence of venal pools, not finding much. 2 Eryngium plants in tire track holes. Other upland natives may have been present earlier in season.																																																																	
<table border="1"> <thead> <tr> <th colspan="2">% Cover: Conifer</th> <th>Hardwood</th> <th>Total Tree</th> <th>Regen Tree</th> <th>Shrub</th> <th>Herb</th> <th>Total Veg</th> <th colspan="2">Exotics (L,M,H)</th> </tr> <tr> <th>Strata</th> <th>Species</th> <th>% cover</th> <th>Strata</th> <th>Species</th> <th>% cover</th> <th>Strata</th> <th>Species</th> <th>% cover</th> <th>% cover</th> </tr> </thead> <tbody> <tr> <td></td> <td>Elymus</td> <td>11</td> <td></td> <td>Festuca perennis</td> <td><1</td> <td></td> <td>Trifolium sp.</td> <td></td> <td>r</td> </tr> <tr> <td></td> <td>Avena sp.</td> <td>8</td> <td></td> <td>Bromus hordeaceus</td> <td><1</td> <td></td> <td>Aster sp. see photo</td> <td></td> <td>r</td> </tr> <tr> <td></td> <td>Aegilops triuncialis</td> <td>2</td> <td></td> <td>D. multiflorum</td> <td><1</td> <td></td> <td>Erodium botrys</td> <td></td> <td>r</td> </tr> <tr> <td></td> <td>Biza maxima</td> <td>19</td> <td></td> <td>Calycadenia sp.</td> <td><1</td> <td></td> <td>Micropus californicus</td> <td></td> <td>r</td> </tr> </tbody> </table>						% Cover: Conifer		Hardwood	Total Tree	Regen Tree	Shrub	Herb	Total Veg	Exotics (L,M,H)		Strata	Species	% cover	Strata	Species	% cover	Strata	Species	% cover	% cover		Elymus	11		Festuca perennis	<1		Trifolium sp.		r		Avena sp.	8		Bromus hordeaceus	<1		Aster sp. see photo		r		Aegilops triuncialis	2		D. multiflorum	<1		Erodium botrys		r		Biza maxima	19		Calycadenia sp.	<1		Micropus californicus		r
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	Biza maxima	19		Calycadenia sp.	<1		Micropus californicus		r																																																								

Appendix C: Plant species list

Clay Pit SVRA Plant Species List, assembled from all years of survey data. May include species that have been misidentified in years past.

Family	Scientific name	Common name
Agavaceae	<i>Chlorogalum angustifolium</i>	Narrowleaf soap plant
Agavaceae	<i>Chlorogalum pomeridianum</i>	Soap plant
Alliaceae	<i>Allium amplexans</i>	Narrowleaf onion
Anacardiaceae	<i>Toxicodendron diversilobum</i>	Poison oak
Apiaceae	<i>Anthriscus caucalis</i>	Bur chervil
Apiaceae	<i>Eryngium articulatum</i>	Beethistle, coyote thistle
Apiaceae	<i>Eryngium castrense</i>	Coyote thistle, Great Valley button celery
Apiaceae	<i>Lomatium caruifolium</i>	Caraway-leaved lomatium
Apiaceae	<i>Torilis nodosa</i>	Hedge parsley
Asteraceae	<i>Achyrrachena mollis</i>	Blow-wives
Asteraceae	<i>Bacharis pillularis</i>	Coyote brush
Asteraceae	<i>Blennosperma nanum</i> var. <i>nanum</i>	Yellow carpet, Glue seed
Asteraceae	<i>Calycadenia spicata</i>	Spiked rosinweed
Asteraceae	<i>Centaurea solstitialis</i>	Yellow starthistle
Asteraceae	<i>Centromadia fitchii</i>	Fitch's tarweed
Asteraceae	<i>Centromadia pungens</i>	Common tarweed
Asteraceae	<i>Chondrilla juncea</i>	Skeleton weed
Asteraceae	<i>Erigeron sumatrensis</i>	Tropical horseweed
Asteraceae	<i>Gnaphalium</i> sp.	Cudweed
Asteraceae	<i>Grindelia camporum</i>	Great valley gumweed
Asteraceae	<i>Heterotheca grandiflora</i>	Telegraph Weed
Asteraceae	<i>Holocarpha virgata</i>	Narrow tarplant
Asteraceae	<i>Hedypnois rhagadioloides</i>	Cretanweed
Asteraceae	<i>Heterotheca grandiflora</i>	Telegraph weed
Asteraceae	<i>Hypochaeris glabra</i>	Smooth cat's ear
Asteraceae	<i>Hypochaeris radicata</i>	Rough cat's-ear
Asteraceae	<i>Lactuca serriola</i>	Prickly lettuce
Asteraceae	<i>Lagophylla glandulosa</i>	Glandular hareleaf
Asteraceae	<i>Lasthenia californica</i>	California goldfields
Asteraceae	<i>Lasthenia fremontii</i>	Fremont's goldfields
Asteraceae	<i>Layia fremontii</i>	Fremont's tidytips
Asteraceae	<i>Leontodon saxatilis</i>	Hawkbit
Asteraceae	<i>Lessingia virgata</i>	Wand lessingia
Asteraceae	<i>Logfia gallica</i>	Narrow-leaf cottonrose
Asteraceae	<i>Matricaria discoidea</i>	Pineapple weed

Asteraceae	Micropus californicus	Q-tip plant
Asteraceae	Microseris acuminata	Needle microseris
Asteraceae	Psilocarphus brevissimus	Woolly marbles
Asteraceae	Psilocarphus brevissimus var. brevissimus	Dwarf woolly-heads
Asteraceae	Psilocarphus oregonus	Oregon woolly-heads
Asteraceae	Psilocarphus tenellus	Slender woollyheads
Asteraceae	Senecio vulgaris	Common groundsel
Asteraceae	Silybum marianum	Milk thistle
Asteraceae	Soliva sessilis	Common soliva
Asteraceae	Sonchus asper	Prickley sowthistle
Asteraceae	Sonchus oleraceus	Sow thistle
Asteraceae	Taraxacum officinale	Dandelion
Asteraceae	Xanthium strumarium	Cocklebur
Betulaceae	Alnus rhombifolia	White alder
Boraginaceae	Plagiobothrys canescens	Valley popcornflower
Boraginaceae	Plagiobothrys greenei	Greene's popcornflower
Boraginaceae	Plagiobothrys stipitatus	Stipitate popcornflower
Boraginaceae	Plagiobothrys stipitatus var. micranthus	Stalked popcornflower
Brassicaceae	Lepidium nitidum var. nitidum	Shining peppergrass
Brassicaceae	Lepidium strictum	Upright peppergrass
Brassicaceae	Thysanocarpus radians	Fringe pod
Campanulaceae	Downingia bicornuta	Doublehorn calicoflower
Campanulaceae	Downingia bicornuta ssp. bicornuta	Double-horned downingia
Campanulaceae	Downingia ornatissima	Folded downingia
Campanulaceae	Downingia pusilla	Dwarf downingia
Caryophyllaceae	Cerastium glomeratum	Mouse-ear chickweed
Caryophyllaceae	Dianthus nudiflorus	Stiff velezia
Caryophyllaceae	Petrorhagia prolifera dubia	Childing Windmill pink
Caryophyllaceae	Scleranthus annuus ssp. annuus	German knotgrass
Caryophyllaceae	Silene gallica	Common catch-fly
Caryophyllaceae	Spergula arvensis	Corn spurry
Caryophyllaceae	Spergularia bocconi	Boccon's sand-spurrey
Caryophyllaceae	Spergularia rubra	Red sand-spurrey
Convolvulaceae	Convolvulus arvensis	Bindweed
Crassulaceae	Crassula aquatica	Water pygmyweed
Crassulaceae	Crassula tillaea	Mediterranean Mossy pygmy weed
Cyperaceae	Carex feta	Green sheathed carex
Cyperaceae	Carex sp.	Sedge
Cyperaceae	Cyperus eragrostis	Nut sedge
Cyperaceae	Cyperus sp.	Flatsedge

Cyperaceae	Eleocharis acicularis	Needle spikerush
Cyperaceae	Eleocharis macrostachya	Pale spikerush
Euphorbiaceae	Croton setiger	Turkey-mullein, Dove weed
Euphorbiaceae	Euphorbia maculata	Spotted spurge
Fabaceae	Acmispon americanus	Spanish lotus
Fabaceae	Acmispon parviflorus	Hill lotus
Fabaceae	Acmispon wrangelianus	Chilean trefoil
Fabaceae	Lathyrus odoratus	Sweet pea
Fabaceae	Lupinus bicolor	Dwarf lupine
Fabaceae	Lupinus nanus	Sky Lupine
Fabaceae	Medicago polymorpha	California burclover
Fabaceae	Trifolium albopurpureum	Rancheria clover
Fabaceae	Trifolium depauperatum var. depauperatum	Balloon Cowbag clover
Fabaceae	Trifolium dubium	Little hop clover
Fabaceae	Trifolium fragiferum	Strawberry clover
Fabaceae	Trifolium glomeratum	Clustered clover
Fabaceae	Trifolium hirtum	Rose clover
Fabaceae	Trifolium tomentosum	Wooly clover
Fabaceae	Trifolium willdenovii	Tomcat clover
Fabaceae	Vicia sativa	Common vetch, spring vetch
Fabaceae	Vicia villosa	Hairy vetch, winter vetch
Fagaceae	Quercus lobata	Valley oak
Gentianaceae	Cicendia quadrangularis	Timwort
Gentianaceae	Zeltnera muehlenbergii	Muehlenberg's centaury
Geraniaceae	Erodium botrys	Long-beaked filaree
Geraniaceae	Erodium brachycarpum	White-stemmed filaree
Geraniaceae	Erodium cicutarium	Red-stemmed filaree
Geraniaceae	Erodium moschatum	White-stemmed filaree
Geraniaceae	Geranium dissectum	Cut-leaf geranium
Hypericaceae	Hypericum concinnum	Goldwire
Hypericaceae	Hypericum perforatum	Klamath weed, St. Johnswort
Iridaceae	Iris sp. x germanica	Bearded iris
Isoetaceae	Isoetes sp. howellii	Quillwort
Juncaceae	Juncus bufonius	Toad rush
Juncaceae	Juncus capitatus	Capitate rush
Juncaceae	Juncus effusus	Common rush
Lamiaceae	Pogogyne zizyphoroides	Sacramento mesamint
Lamiaceae	Trichostema lanceolatum	Vinegarweed
Liliaceae	Calochortus luteus	Yellow mariposa lily
Lythraceae	Ammannia robusta	Grand ammania
Lythraceae	Lythrum hyssopifolia	Hyssop loosestrife

Marsileaceae	<i>Pilularia americana</i>	American pillwort
Molluginaceae	<i>Molluga verticillata</i>	Green carpertweed
Montiaceae	<i>Calandrinia menziesii</i>	Red maids
Moraceae	<i>Morus alba</i>	Mulberry
Myrsinaceae	<i>Lysimachia minima</i>	Chaffweed
Myrtaceae	<i>Eucalyptus camaldulensis</i>	River redgum
Onagraceae	<i>Clarkia purpurea</i>	Purple clarkia
Onagraceae	<i>Clarkia purpurea</i> ssp. <i>quadrivulnera</i>	Wine cup clarkia
Onagraceae	<i>Clarkia</i> sp.	Clarkia
Onagraceae	<i>Epilobium brachycarpum</i>	Panicled willowherb
Onagraceae	<i>Epilobium densiflorum</i>	Denseflower willowherb
Orobanchaceae	<i>Castilleja attenuata</i>	Valley tassles
Orobanchaceae	<i>Castilleja campestris</i> ssp. <i>campestris</i>	Field Vernal pool paintbrush
Orobanchaceae	<i>Triphysaria eriantha</i> ssp. <i>eriantha</i>	Butter 'n' eggs, Johnny tuck
Papaveraceae	<i>Eschscholzia lobbi</i>	Frying pans
Phrymaceae	<i>Erythranthe guttata</i>	Yellow monkeyflower
Plantaginaceae	<i>Callitriche marginata</i>	Starwort
Plantaginaceae	<i>Gratiola ebracteata</i>	Bractless hedge-hyssop
Plantaginaceae	<i>Plantago coronopus</i>	Buckhorn plantain
Plantaginaceae	<i>Plantago elongata</i>	Long leaf Coastal plantain
Plantaginaceae	<i>Plantago erecta</i>	Dotseed plantain
Plantaginaceae	<i>Plantago lanceolata</i>	Narrowleaved plantain
Plantaginaceae	<i>Veronica peregrina</i> ssp. <i>xalapensis</i>	Hairy purslane speedwell
Poaceae	<i>Aegilops triuncialis</i>	Barbed goatgrass
Poaceae	<i>Agrostis</i> sp.	Bentgrass
Poaceae	<i>Aira caryophyllea</i>	Silver hairgrass
Poaceae	<i>Alopecurus saccatus</i>	Pacific foxtail
Poaceae	<i>Aristida oligantha</i>	Prairie threeawn
Poaceae	<i>Aristida ternipes</i> ssp. <i>gentilis</i>	Spidergrass, Hook three awn
Poaceae	<i>Avena barbata</i>	Slender wild oats
Poaceae	<i>Avena fatua</i>	Wild oat
Poaceae	<i>Brachypodium distachyon</i>	Purple false brome
Poaceae	<i>Briza maxima</i>	Big rattlesnake grass, quaking
Poaceae	<i>Briza minor</i>	Little rattlesnake grass, quaking
Poaceae	<i>Bromus diandrus</i>	Rip-gut brome
Poaceae	<i>Bromus hordeaceus</i>	Soft chess
Poaceae	<i>Bromus madritensis</i> ssp. <i>rubens</i>	Foxtail brome
Poaceae	<i>Cynodon dactylon</i>	Bermuda grass
Poaceae	<i>Deschampsia danthonioides</i>	Annual hairgrass
Poaceae	<i>Distichlis spicata</i>	Saltgrass
Poaceae	<i>Echinochloa crus-galli</i>	Barnyard grass

Poaceae	<i>Elymus caput-medusae</i>	Medusa head
Poaceae	<i>Eragrostis pilosa</i>	Indian lovegrass
Poaceae	<i>Eriochloa contracta</i>	Dense cupgrass
Poaceae	<i>Festuca microstachys</i>	Small fescue
Poaceae	<i>Festuca myuros</i>	Rat-tail fescue
Poaceae	<i>Festuca perennis</i>	Italian ryegrass
Poaceae	<i>Gastridium ventricosum</i>	Nit grass
Poaceae	<i>Glyceria declinata</i>	Waxy mannagrass
Poaceae	<i>Hordeum marinum</i> ssp. <i>gussoneanum</i>	Mediterranean barley
Poaceae	<i>Lachnagrostis filiformis</i>	Blown grass
Poaceae	<i>Leptochloa fusca</i> ssp. <i>uninervia</i>	Mexican sprangle-top
Poaceae	<i>Paspalum dilatatum</i>	Dallis grass
Poaceae	<i>Poa annua</i>	Annual bluegrass
Poaceae	<i>Polypogon monspeliensis</i>	Rabbit's foot grass, Annual beard grass
Poaceae	<i>Setaria parviflora</i>	Bristly foxtail
Poaceae	<i>Sorghum halepense</i>	Johnsongrass
Poaceae	<i>Stipa pulchra</i>	Purple needlegrass
Polemoniaceae	<i>Gilia</i> sp.	<i>Gilia</i>
Polemoniaceae	<i>Leptosiphon bicolor</i>	True babystars
Polemoniaceae	<i>Navarretia intertexta</i>	Needleleaf navarretia
Polemoniaceae	<i>Navarretia leucocephala</i>	White-headed navarretia
Polemoniaceae	<i>Navarretia leucocephala</i> ssp. <i>leucocephala</i>	Whitehead navarretia
Polemoniaceae	<i>Navarretia prostrata</i>	Prostrate vernal pool navarretia
Polemoniaceae	<i>Navarretia pubescens</i>	Purple navarretia
Polemoniaceae	<i>Navarretia tagetina</i>	Marigold navarretia
Polygonaceae	<i>Eriogonum nudum</i>	Nude buckwheat
Polygonaceae	<i>Persicaria hydropiperoides</i>	Water pepper
Polygonaceae	<i>Polygonum aviculare</i> ssp. <i>depressum</i>	Prostrate knotweed
Polygonaceae	<i>Rumex crispus</i>	Curly dock
Ranunculaceae	<i>Delphinium variegatum</i>	Royal larkspur
Rubiaceae	<i>Crucianella angustifolia</i>	Narrow-leaved crosswort
Rubiaceae	<i>Galium aparine</i>	Common bedstraw
Rubiaceae	<i>Galium parisiense</i>	Wall bedstraw
Rubiaceae	<i>Sherardia arvensis</i>	Field madder
Salicaceae	<i>Populus fremontii</i> ssp. <i>fremontii</i>	Fremont's cottonwood
Salicaceae	<i>Salix exigua</i>	Sandbar willow
Salicaceae	<i>Salix lasiolepis</i>	Arroyo willow
Scrophulariaceae	<i>Limosella aquatica</i>	Mudwort

Scrophulariaceae	Verbascum blattaria	Moth mullein
Tecophilaeaceae	Odontostomum hartwegii	Hartweg's doll's lily
Themidaceae	Brodiaea coronaria	Crown brodiaea
Themidaceae	Brodiaea elegans	Harvest brodiaea
Themidaceae	Brodiaea nana	Vernal pool brodiaea
Themidaceae	Brodiaea rosea ssp. vallicola	Valley brodiaea
Themidaceae	Dichelostemma Dipterostemon capitatum	Bluedicks, Wild hyacinth
Themidaceae	Dichelostemma multiflorum	Many flowered brodiaea
Themidaceae	Triteleia hyacinthina	White brodiaea
Typhaceae	Typha angustifolia	Narrow-leaved cattail
Typhaceae	Typha sp. latifolia	Broadleaf cattail
Viburnaceae	Sambucus mexicana	Blue elderberry
Viscaceae	Phoradendron leucarpum ssp. macrophyllum	Broadleaf mistletoe
Vitaceae	Vitis californica	California wild grape

Appendix D: Reconnaissance protocol and field form

Protocols and blank forms for the “Recon” protocol, a shortened version of the Relevé/Rapid Assessment survey, is included here, since it is not published on the VegCAMP website.

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE PROTOCOL FOR
RECON FIELD FORM
(March 30, 2017)

This protocol describes the methodology for the reconnaissance technique as recorded in the Recon Field Form dated March 30, 2017. Reconnaissance surveys (recons) are complementary to relevés and rapid assessments, but collect only a small subset of the data gathered using the more detailed methods. Recons are generally used as an aid to digital vegetation mapping, to determine the boundaries of a stand, or to illustrate a particular vegetation signature. For more background on the relevé and rapid assessment sampling methods, see the relevé and rapid assessment protocol at <http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18599>.

Definitions of fields in the form

LOCATIONAL/ENVIRONMENTAL DESCRIPTION

Recorder: The full name of the recorder should be provided for the first field form for the day. On successive forms, initials can be recorded.

Other Surveyors: The full name of each person assisting should be provided for the first field form for the day. On successive forms, initials of each person assisting can be recorded.

Date: Date of the sampling.

Return?: Check this box if team members should return to this spot at a later date to take a recon or RA/relevé. This can be used if the phenology is not conducive to identification of the major species, or if there is not enough time to take the survey.

Waypoint ID: The Waypoint ID in this format: GPS device name + date (yymmdd) + time (hhmm). For example, for a survey taken on iPad "V" on March 27 at 1:45 in the afternoon, the Waypoint ID will be "V1803271345."

UID: The ID number of a reference point or polygon which this reconnaissance describes.

Location Name: The name of the property, park, or the location within large holdings (like USFS or BLM properties).

GPS name: The name/number assigned to the GPS unit.

Projected? Yes / No / Base / Digitized: Circle the appropriate option:

Yes - The point is a projected, or offset point. The surveyor used a bearing and distance to project the point to match what they are describing with the survey.

No - The surveyors are in the vegetation they are describing and the point is where the observer was standing for photographs. This location can also be used as a base location for an offset survey.

Base - Base point only. This is where a surveyor was standing when taking an offset survey to describe vegetation not at that point. No plant data or vegetation descriptions are associated with this location. However, cardinal photos taken at this point will be stored in a directory of this name.

Digitized - An offset point was created on the GPS unit without taking bearing and distance readings. This option should only be used when the imagery on the GPS unit is unique and unmistakable.

Bearing (°): The compass bearing from the Base point to the Projected point.

Distance (m): The distance in meters from the Base point to the Projected point, determined by use of a range finder.

Inclination (°): The vertical offset from the Base point to the Projected point.

Base Waypoint ID: For a projected or digitized point, this is the location where the surveyor was standing when the information was collected. Cardinal photographs will be taken at this point and will be stored on the computer under this ID. Photographs of the stand vegetation will be taken from this point and will be stored on the computer under the Projected point's ID.


Base / Projected UTM's or Decimal degrees: If the point is projected or digitized, circle whether the coordinates of the base point or the offset point have been recorded. These will generally be for the offset point.

GPS error: ft./m./PDOP: The accuracy of the GPS location. Record the error reading and circle the appropriate units.

GPS coordinates: Record either UTM coordinates, easting (**UTME**) and northing (**UTMN**), or decimal degrees, **LAT** (latitude) and **LONG** (longitude). Record this information from a GPS unit.

Stand Size: Estimate the size of the entire stand in which the sample is taken and circle the appropriate range. As a measure, one acre is similar in size to a football field.

View Radius: Enter the radius, in meters, of the viewable area of the stand from the survey point; the radius should be a minimum of 20 meters.

Camera/Photos: Write the name camera, JPG numbers, and direction of photos. Take four photos in the main cardinal directions (N, E, S, W) clockwise from the north, from the GPS location. This symbol can be used to indicate the cardinal photos: . If additional photos are taken in other directions, please note the JPG numbers and a description of each photo.

HABITAT AND VEGETATION DESCRIPTION

Field alliance name: Name of alliance following the most recent Manual of California Vegetation (Sawyer, Keeler-Wolf, and Evens 2009), using scientific nomenclature, *e.g.*, *Quercus agrifolia*. An alliance is based on the dominant or diagnostic species of the stand, and usually reflects the uppermost and/or dominant height stratum. A dominant species covers the greatest area. A diagnostic species is consistently found in some vegetation types but not others.

Please note: The field-assessed alliance name may not exist in the present classification, in which case you can provide a new alliance name in this field.

Comments: Briefly describe the stand age/seral stage, disturbance history, nature and extent of land use, and other site environmental and vegetation factors that will aid in the mapping effort.

% Cover:

Conifer: The total cover of all the conifer trees taking into consideration the porosity, or the holes, in the vegetation. This is an estimate of the absolute conifer cover, disregarding the overlap¹ of individual trees.

Hardwood: The total cover of all the hardwood trees taking into consideration the porosity, or the holes, in the vegetation. This is an estimate of the absolute hardwood tree cover, disregarding the overlap¹ of individual trees.

¹ Porosity reduces the total cover of the canopy. Overlapping strata should not be included in the total cover percent; for instance, if a shrub is growing under a tree, only the cover of the tree will be added into the total; the cover of the shrub will be disregarded, except for the amount by which it fills in the porosity of the tree canopy.

Total Tree: The total cover of all the trees taking into consideration the porosity, or the holes, in the vegetation. This is an estimate of the absolute tree cover, disregarding the overlap¹ of individual trees.

Regen Tree: The total foliar cover of seedlings and saplings, disregarding overlap¹ of individual recruits. See seedling and sapling definitions below.

Shrub: The total cover of all the shrubs taking into consideration the porosity, or the holes, in the vegetation. This is an estimate of the absolute shrub cover, disregarding the overlap¹ of individual shrubs.

Herb: The total cover of all the herbs taking into consideration the porosity, or the holes, in the vegetation. This is an estimate of the absolute herbaceous cover, disregarding the overlap¹ of individual herbs.

Total Veg: The total cover of all vascular vegetation taking into consideration the porosity, or the holes, in the vegetation. This is an estimate of the absolute vegetation cover, disregarding the overlap¹ of the various tree, shrub, and/or herbaceous layers and species.

Exotics (L,M,H): The extent to which the stand is impacted by exotic/non-native species. Divide the total exotic cover (e.g. 25% *Bromus diandrus* + 8% *Bromus madritensis* + 5% *Centaurea melitensis* = 38% total exotics) by the Total Veg cover (e.g. 80% total) and multiply by 100 to get the % relative cover of exotics (e.g. 38% total exotics / 80% total cover = 48% relative exotic cover). **L** = 0-33% *relative* cover of exotics; **M** = 34-66% relative cover, and **H** = >66% relative cover.

Species List and Coverage

List the species that are dominant or that are characteristically consistent throughout the stand. This list is used if there is some uncertainty in the field-assessed alliance name, so the most common species should be listed. In the interests of time and efficiency, this species list should not be exhaustive.

Strata:

T = Tree. A woody perennial plant that has a single trunk.

A = SApling. 1" - <6" dbh and young in age, OR small trees that are <1" dbh, are clearly of appreciable age, and are kept short by repeated browsing, burning, or other disturbance. Includes trees that are re-sprouting from roots or stumps following fire, logging or other disturbance. These re-sprouts may exhibit a shrubby form, with multiple small trunks, but are species that are generally considered trees. If a majority of the trunks are >6" dbh, then the re-sprouts would be recorded under the "Tree" stratum.

E = SEedling. A tree species clearly of a very young age that is < 1" dbh or has not reached breast height. Applies only to trees propagating from seed; re-sprouts are not recorded here even if they meet the size requirements.

S = Shrub. A perennial, woody plant, that is multi-branched and doesn't die back to the ground every year.

H = Herb. An annual or perennial that dies down to ground level every year.

N = Non-vascular. Includes moss, lichen, liverworts, hornworts, cryptogammic crust, and algae.

When one or more tree species are regenerating, the Tree, Seedling and/or Sapling strata may be noted on the same line, e.g.:

Strata	Species	%Cover	C
T/A/E	Quercus douglasii	40/<1/<1	blank

Species: Use Jepson Manual nomenclature. When uncertain of an identification (which you intend to confirm later) use parentheses to indicate what part of the determination needs to be confirmed. For example, you could write out *Brassica (nigra)* if you are sure it is a *Brassica* but you need further clarification on the specific epithet.

% cover: provide the % absolute aerial cover for each species listed. All species percent covers may total over 100% because of overlap.

Collections: If a species collection is made, it should be indicated in the blank column next to “% cover” with a “C” (for collected). If the species is later keyed out, cross out the species name or description and write the keyed species name in pen on the data sheet. Do not erase what was written in the field, because this information can be used if specimens get mixed up later. If the specimen is then thrown out, add a “T” to the “C” in that column (CT = thrown out after confirmation) or cross out the “C”. If the specimen is kept but is still not confidently identified, add a

“U” to the “C” (CU = collected and unconfirmed). In this case the unconfirmed species epithet should be put in parentheses [e.g. *Hordeum (murinum)*]. If the specimen is kept and is confidently identified, add a “C” to the existing “C” (CC = collected and confirmed). If the specimen is later deposited in an herbarium, add a “D” to the existing “C” (CD = collected and deposited) and note the receiving herbarium.

RECON FIELD FORM (March 6, 2019, with slope/aspect)

Recorder:		Other Surveyors:		Date:		Return? <input type="checkbox"/>																																																																																																																									
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