

Imagery

The ESRI Basemap imagery service (5/05/2012) was used as the base imagery. Ancillary imagery included NAIP 2012 (true color and color infrared) and all the imagery provided by Google Earth.

Vegetation Mapping Classification

The vegetation mapping types are based on the vegetation classification that was developed for the larger Desert Renewable Energy Conservation Plan (DRECP) mapping project (CDFW 2013). The vegetation classification was developed using a compilation of data collected for several projects including Anza-Borrego Desert State Park and Environs (Keeler-Wolf et al. 1998), the Mojave Desert Ecosystem Program's Vegetation Database (Thomas et al. 2004), Vegetation of Joshua Tree National Park (La Doux et al. 2013), and Vegetation Classification and Mapping at Lake Mead National Recreation Area, Mojave National Preserve and Death Valley National Park (in progress, draft as of 2014). See Appendix A for the full vegetation mapping classification.

Field Data Collection

Vegetation field reconnaissance was conducted by Todd Keeler-Wolf and Rachelle Boul during the week of February 24-28th, 2014. A total of 58 data points were collected using a reconnaissance datasheet (Appendix B) and protocol (Appendix C) specifically developed for this project as modified from the datasheet and protocol used for the DRECP project. The data were entered into an Access database.

Photointerpretation Mapping Procedures

Minimum mapping unit

- 2 acres for uplands
- 0.5 acre for wetlands and special types
- 2 acres to break on cover in overstory in 1% cover class increments:
- 2 acres to break on herbaceous cover class (see below) as understory
- 5 meter minimum width (polygon can fall below minimum width if average width of polygon meets the 5 meter minimum)

Map attributes

- **Map Unit:** Vegetation mapping type.
- **Vegetation cover:** Absolute cover estimates are made by taking into consideration the porosity, or the holes, in the plant canopy, and disregard overlap.
 - **Conifer** tree cover estimated in 1% intervals
 - **Hardwood** tree cover estimated in 1% intervals
 - **Joshua Tree** cover estimated in cover classes

- None
 - <1% uneven distribution
 - 1-5% with even distribution
 - >5%
 - Not applicable
- **Shrub** cover estimated in 1% intervals
- **Herbaceous** cover estimated using cover classes
 - 0-2%
 - >2-15%
 - >15-40%
 - >40%
- **Exotics:** Estimation of the relative cover of invasive exotic presence.
 - 0: None visible.
 - 1: Patches of exotics visible, but cover not significant (relative cover to total <33%).
 - 2: Exotics (particularly herbaceous) significant and cover may exceed dominant vegetation strata (relative cover <66%).
 - 3: Stand characterized by exotics (vegetation type is “exotic”) (relative cover >66%).
 - 9: Not applicable/Not assigned.
- **Roadedness:** Visual estimation of the percent of each polygon that is affected by paved or dirt roads.
 - 0: None visible.
 - 1: Low; at least 2/3 (67% to 100%) of a contiguous area within the vegetation polygon lacks roads of any kind.
 - 2: Moderate; between 1/3 and 2/3 (33% to 66%) of a contiguous area within the vegetation polygon lacks roads of any kind.
 - 3: High; less than 1/3 (<33%) of a contiguous area within the vegetation polygon lacks roads of any kind.
 - 9: Not applicable/Not assigned.
- **Development:** Visual estimation of the percent of each polygon that is affected by structures and settlements.
 - 0: None visible.
 - 1: Low; less than 2% of polygon affected.
 - 2: Moderate; between 2% to 5% of the polygon affected.
 - 3: High; more than 5% of polygon affected.
 - 9: Not applicable/Not assigned.
- **Anthropogenic alteration:** Estimation of the level of impact on vegetation through tillage, scraping, grazing, mining, etc.
 - 0: None visible
 - 1: Less than 33% of the polygon is affected and/or impact is seen but does not affect vegetation cover or type.
 - 2: Between 33% to 66% of the polygon is affected.
 - 3: More than 66% of the polygon is affected.
 - 9: Not applicable/Not assigned.
- **Hydrologic modifications:** This attribute denotes where a wash or sheet flow has been diverted from its natural path by restricted sheet flow or active channel flow crossing under a road, railroad, berm, etc., resulting in a vegetation difference downslope.

- 0: no hydrological impediment effect
- 1: Hydrological impediment effects observed
- 9: Not applicable/Not assigned
- **Presence of LATR clones:**
 - Not present or consistent: <10% of the Larrea tridentata is visibly clonal at a scale of 1:1500 and/or they are not evenly distributed.
 - Present: >10% of the Larrea tridentata is visibly clonal at a scale of 1:1500 and they are evenly distributed.
- **Method:** Method used to determine map unit and other map attributes.
 - Relevé
 - Field Verification or Accuracy Assessment
 - Photo interpretation
 - Adjacent stand information or photo
 - Other information
 - Rapid assessment (current project)
 - Reconnaissance (current project)
 - Older plot data
 - Older reconnaissance data

Literature Cited

- California Department of Fish and Wildlife (CDFW 2013). 2013 California Desert Vegetation Map and Accuracy Assessment in Support of the Desert Renewable Energy Conservation Plan. CDFW Vegetation Classification and Mapping Program and Aerial Information Systems, Inc. for CDFW and the California Energy Commission. Sacramento, CA. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=62825>
- Keeler-Wolf, T., K. Lewis, and C. Roye. 1998. Vegetation Mapping of Anza-Borrego Desert State Park and Environs. California Department of Fish and Game, Sacramento, CA. <http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18246>
- La Doux, T., C. Lea, and E. Babich. 2013. A summary of the Joshua Tree National Park Vegetation Mapping Project: NPS Vegetation Inventory Program. Natural Resource Technical Report NPS/JOTR/NRTR—2013/723. National Park Service, Fort Collins, Colorado.
- Thomas, K., T. Keeler-Wolf, J. Franklin and P. Stine. 2004. Mojave Desert Ecosystem Program: Central Mojave Vegetation Database. Final Report, U.S. Geological Survey, Western Ecological Research Center and Southwest Biological Science Center, Sacramento, CA. Colorado Plateau Field Station, Flagstaff, AZ. <http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=13890>

APPENDIX A

Mapping Classification

Vegetation Type (Map Unit)

NOTE: * indicates a map unit that was not in the final geodatabase

indicates a Group level code value that was assigned as a broader code for a given polygon in the final geodatabase

XXXX = Types that were mapped to a 0.5 acre MMU. All other types for the Johnson Valley mapping were mapped to a 2 acres MMU.

1000 = TEMPERATE FOREST SUBCLASS

1100 = California Forest and Woodland Macrogroup MG009

1110 = Californian broadleaf forest and woodland Group

1111 = Quercus douglasii (Blue oak woodland) Alliance

1112 = Quercus lobata (Valley oak woodland) Alliance

1113 = Quercus chrysolepis (Canyon live oak forest) Alliance

1114 = Quercus wislizeni (Interior live oak woodland) Alliance

**1115 = Juglans californica (California walnut groves) Alliance*

1116 = Aesculus californica (California buckeye groves) Alliance

1117 = Quercus agrifolia (Coast live oak woodland) Alliance

1120 = Californian evergreen coniferous forest and woodland Group

1121 = Pinus sabiniana (Foothill pine woodland) Alliance

1122 = Juniperus californica (California juniper woodland) Alliance

1200 = Californian-Vancouverian Montane and Foothill Forest Macrogroup MG023

1210 = Californian montane conifer forest Group

1211 = Pseudotsuga macrocarpa (Bigcone Douglas-fir) Alliance

1300 = Intermountain Basins Pinyon-Juniper Woodland Macrogroup MG026

1310 = Western Great Basin montane conifer woodland Group

1311 = Pinus monophylla (Singleleaf pinyon woodland) Alliance

**1400 = Southwestern North American Riparian, Flooded and Swamp Forest Macrogroup
MG036**

1410 = Southwestern North American riparian evergreen and deciduous woodland
Group

1411 = *Populus fremontii* (Fremont cottonwood forest) Alliance

1412 = *Salix laevigata* (Red willow thickets) Alliance

*1413 = *Salix gooddingii* (Black willow thickets) Alliance

1414 = *Platanus racemosa* (California sycamore woodlands) Alliance

*1415 = *Washingtonia filifera* (California fan palm oasis) Alliance

1420 = Southwestern North American riparian/wash scrub Group

*1421 = *Baccharis emoryi* (Emory's baccharis thickets) Provisional Alliance

1422 = *Baccharis salicifolia* (Mulefat thickets) Alliance

1423 = *Baccharis sergiloides* (Broom baccharis thickets) Alliance

1424 = *Salix exigua* (Sandbar willow thickets) Alliance

1425 = *Forestiera pubescens* (Desert olive patches) Alliance

1426 = *Sambucus nigra* (Blue elderberry stands) Alliance

1427 = *Salix lasiolepis* (Arroyo willow thickets) Alliance

1430 = Southwestern North American introduced riparian scrub Group

1431 = *Arundo donax* (Giant reed breaks) Semi-natural Stands

1432 = *Tamarix* spp. (Tamarisk thickets) Semi-natural Stands

1500 = Western Cordilleran Montane-Boreal Riparian Scrub and Forest Macrogroup MG034

1510 = Vancouverian riparian deciduous forest Group

1511 = *Alnus rhombifolia* (White alder groves) Forest Alliance

2000 = MESOMORPHIC SHRUB AND HERB CLASS

2100 = California Chaparral Macrogroup MG043

2110 = Californian xeric chaparral Group

2111 = Arctostaphylos glauca (Bigberry manzanita chaparral) Alliance

2112 = Adenostoma fasciculatum (Chamise) Alliance

2113 = Ceanothus crassifolius (Hoary leaf ceanothus chaparral) Alliance

2114 = Fremontodendron californicum (flannelbush scrub) Alliance

2115 = Adenostoma fasciculatum – Salvia mellifera (Chamise – black sage chaparral) Alliance

2120 = Californian pre-montane chaparral Group

2121 = Arctostaphylos glandulosa (Eastwood manzanita) Alliance

2122 = Ceanothus leucodermis (Chaparral whitethorn) Alliance

2130 = Californian mesic chaparral Group

2131 = Cercocarpus montanus (Birchleaf mountain mahogany) Alliance

2132 = Quercus berberidifolia (Scrub oak chaparral) Alliance

2133 = Quercus berberidifolia – Adenostoma fasciculatum (Scrub oak – chamise chaparral) Alliance

2134 = Prunus ilicifolia (Holly leaf cherry chaparral) Alliance

2200 = California Coastal Scrub Macrogroup MG044

2210 = Central and south coastal California seral scrub Group

**2211 = Gutierrezia californica (California match weed patches) Provisional Alliance*

**2212 = Lotus scoparius (Deer weed scrub) Alliance*

**2213 = Lupinus albifrons (Silver bush lupine scrub) Alliance*

2214 = *Ericameria linearifolia* – *Isomeris arborea* (Narrowleaf goldenbush – bladderpod scrub) Alliance

2215 = *Eriodictyon (crassifolium, trichocalyx)* (Thick leaf and hairy yerba santa scrub) Provisional Alliance

*2216 = *Malacothamnus fasciculatus* (Bush mallow scrub) Alliance

*2217 = *Eriogonum (elongatum, nudum)* (Longstem buckwheat) Provisional Alliance

2218 = *Corethrogyne filaginifolia* (Common sand-aster scrub) Alliance

2220 = Central and South Coastal Californian coastal sage scrub Group

2221 = *Eriogonum fasciculatum* (California buckwheat scrub) Alliance

2222 = *Eriogonum wrightii* (Wright's buckwheat patches) Alliance

*2223 = *Salvia mellifera* (Black sage scrub) Alliance

2300 = California Annual and Perennial Grassland Macrogroup MG045

2305 = California annual and perennial grassland Mapping Unit (Native component)

#2310 = California annual forb/grass vegetation Group

2311 = *Eschscholzia (californica)* (California poppy fields) Alliance

2312 = *Amsinckia (menziesii, tessellata)* (Fiddleneck fields) Alliance

2313 = *Lasthenia californica* - *Plantago erecta* - *Vulpia microstachys* (California goldfields - Dwarf plantain - Six-weeks fescue flower fields) Alliance

*2314 = *Monolopia (lanceolata)*-*Coreopsis (calliopsidea)* (*Monolopia* and *Tickseed*) Alliance

*2315 = *Plagiobothrys nothofulvus* (Popcorn flower fields) Alliance

2320 = California perennial grassland Group

2321 = *Nassella cernua* (Nodding needle grass grassland) Provisional Alliance

*2322 = *Nassella pulchra* (Purple needle grass grassland) Alliance

#2330 = Mediterranean California naturalized annual and perennial grassland Group

2331 = *Brassica nigra* and other mustards (Upland mustards) Semi-natural Stands

*2332 = *Bromus rubens* - *Schismus (arabicus, barbatus)* (Red brome or Mediterranean grass grasslands) Semi-natural Stands

*2333 = *Lolium perenne* (Perennial rye grass fields) Semi-natural Stands

*2334 = *Pennisetum setaceum* (Fountain grass swards) Semi-natural Stands

3000 = TEMPERATE AND BOREAL SHRUBLAND AND GRASSLAND SUBCLASS (3000)

3100 = Western North American Temperate Grassland and Meadow Macrogroup MG048

3110 = Vancouverian and Rocky Mountain naturalized annual grassland Group

*3111 = *Bromus tectorum* (Cheatgrass grassland) Semi-natural Stands

3120 = Western dry upland perennial grassland Group

*3121 = *Elymus multisetus* (Big squirreltail patches) Provisional Alliance

*3122 = *Poa secunda* (Curly or one-sided blue grass grassland) Alliance

3200 = Western Cordilleran Montane Shrubland and Grassland Macrogroup MG049

3210 = Western Cordilleran montane deciduous scrub Group

3211 = *Ribes quercetorum* (Oak gooseberry thickets) Provisional Alliance

3220 = Western Cordilleran montane moist graminoid meadow Group

*3221 = *Muhlenbergia richardsonis* (Mat muhly meadows) Provisional Alliance

3300 = Warm Interior Chaparral Macrogroup MG051

3310 = Western Mojave and Western Sonoran Desert borderland chaparral Group

*3311 = *Ceanothus greggii* (Cup leaf ceanothus chaparral) Alliance

3312 = *Quercus john-tuckeri* (Tucker oak chaparral) Alliance

*3313 = *Quercus palmeri* (Palmer oak) Alliance

3314 = *Quercus cornelius-mulleri* (Muller oak chaparral) Alliance

3400 = Western North American Freshwater Marsh Macrogroup MG073

3410 = Arid West freshwater emergent marsh Group

*3411 = *Phragmites australis* (Common reed marshes) Alliance

3412 = *Schoenoplectus (acutus, californicus)* (Hardstem bulrush, California bulrush) Mapping Unit

* 3413 = *Schoenoplectus acutus* (Hardstem bulrush marsh) Alliance

3414 = *Schoenoplectus californicus* (California bulrush marsh) Alliance

3415 = *Typha (angustifolia, domingensis, latifolia)* (Cattail marshes) Alliance

3500 = Western North America Vernal Pool Macrogroup MG074

#3510 = Californian mixed annual/perennial freshwater vernal pool/swale/plain bottomland Group

*3511 = *Deinandra fasciculata* (Clustered tarweed fields) Alliance

3600 = Western North America Wet Meadow and Low Shrub Carr Macrogroup MG075

3610 = Californian warm temperate marsh/seep Group

3611 = *Juncus arcticus* (var. *balticus, mexicanus*) (Baltic and Mexican rush marshes) Alliance

*3612 = *Leymus triticoides* (Creeping rye grass turfs) Alliance

*3613 = *Muhlenbergia rigens* (Deer grass beds) Alliance

3700 = Warm Semi-Desert/Mediterranean Alkali-Saline Wetland Macrogroup MG083

3710 = Southwestern North American alkali marsh/seep vegetation Group

*3711 = *Spartina gracilis* (Alkali cordgrass marsh) Alliance

3712 = *Sporobolus airoides* (Alkali sacaton grassland) Alliance

*3713 = *Anemopsis californica* (Yerba mansa meadows) Alliance

*3714 = *Juncus cooperi* (Cooper's rush marsh) Alliance

3715 = *Bolboschoenus maritimus*, *Schoenoplectus americanus* (Salt marsh bulrush, American bulrush) Mapping Unit

3720 = Southwestern North American salt basin and high marsh Group

3721 = *Allenrolfea occidentalis* (Iodine bush scrub) Alliance

3722 = *Atriplex lentiformis* (Quailbush scrub) Alliance

3723 = *Atriplex spinifera* (Spinescale scrub) Alliance

3724 = *Frankenia salina* (Alkali heath marsh) Alliance

3725 = *Suaeda moquinii* (Bush seepweed scrub) Alliance

3726 = *Distichlis spicata* (Salt grass flats) Alliance

*3727 = *Salicornia depressa* (Pickleweed flats) Herbaceous Alliance

3728 = *Isocoma acradenia* (Alkali goldenbush) Alliance

3729 = *Atriplex parryi* (Parry's saltbush) Alliance

4000 = WARM SEMI-DESERT SCRUB AND GRASSLAND SUBCLASS

4100 = Mojavean–Sonoran Desert Scrub Macrogroup MG088

#4110 = Lower bajada and fan Mojavean–Sonoran desert scrub Group

4111 = *Ambrosia dumosa* (White bursage scrub) Alliance

4113 = *Atriplex polycarpa* (Allscale scrub) Alliance

4114 = *Encelia farinosa* (Brittle bush scrub) Alliance

4115 = *Larrea tridentata* - *Ambrosia dumosa* (Creosote bush - white bursage scrub) Alliance

4118 = *Larrea tridentata* - *Encelia farinosa* (Creosote bush - brittle bush scrub) Alliance

4119 = *Larrea tridentata* (Creosote bush scrub) Alliance

*4121 = *Tidestromia oblongifolia* (Arizona honey sweet sparse scrub) Provisional Alliance

4122 = *Pleuraphis rigida* (Big galleta shrub-steppe) Alliance

*4123 = *Brickellia desertorum* (Desert brickellbush scrub) Alliance

4150 = Arizonan upland Sonoran desert scrub Group

4151 = *Viguiera parishii* (Parish's goldeneye scrub) Alliance

4200 = Madrean Warm Semi-Desert Wash Woodland/Scrub Macrogroup MG092

4210 = Mojavean semi-desert wash scrub Group

4211 = *Ephedra californica* (California joint fir scrub) Alliance

4212 = *Lepidospartum squamatum* (Scale broom scrub) Alliance

4213 = *Ericameria paniculata* (Blackstem rabbitbrush) Alliance

4214 = *Prunus fasciculata* (Desert almond) Alliance

4215 = *Brickellia incana* (Woolly brickellia wash scrub) Provisional Alliance

4216 = *Ambrosia salsola* (Cheesebush scrub) Alliance

4217 = *Artemisia tridentata* ssp. *parishii* (Parish's sagebrush) Provisional Alliance

4218 = *Bebbia juncea* (Sweet-bush scrub) Provisional Alliance

4220 = Sonoran-Coloradan semi-desert wash woodland/scrub Group

4221 = *Pluchea sericea* (Arrow weed thickets) Alliance

4222 = *Prosopis glandulosa* (Mesquite bosque, mesquite thicket) Alliance

4224 = *Chilopsis linearis* (Desert willow woodland) Alliance

4225 = *Psoralea argophylla* (Smoke tree woodland) Alliance

4226 = *Acacia greggii* (Catclaw acacia thorn scrub) Alliance

4227 = *Parkinsonia florida* - *Olneya tesota* (Blue palo verde - ironwood woodland) Alliance

4228 = *Hyptis emoryi* (Desert lavender scrub) Alliance

5000 = COOL SEMI-DESERT SCRUB AND GRASS SUBCLASS

5100 = Cool Semi-Desert Alkali-Saline Flats Macrogroup MG093

5110 = Shadscale-saltbush cool semi-desert scrub Group

5111 = *Atriplex canescens* (Fourwing saltbush scrub) Alliance

5112 = *Atriplex confertifolia* (Shadscale scrub) Alliance

5200 = Cool Semi-desert wash and disturbance scrub Macrogroup MG095

5210 = Intermontane seral shrubland Group

5211 = *Encelia (actoni, virginensis)* (Acton's encelia & Virgin River brittle brush scrub) Alliance

5212 = *Ericameria nauseosa* (Rubber rabbitbrush scrub) Alliance

5214 = *Gutierrezia sarothrae* (Broom snake weed scrub) Provisional Alliance

5215 = *Ericameria cooperi* (Cooper's goldenbush) Provisional Alliance

5216 = *Dendromecon rigida* (Bush poppy scrub) Alliance

5300 = Western North America Tall Sage Shrubland and Steppe Macrogroup MG096

5310 = Inter-Mountain West mesic tall sagebrush shrubland and steppe Group

5311 = *Artemisia tridentata* (Big sagebrush) Alliance

5400 = Inter-Mountain Dry Shrubland and Grassland Macrogroup MG098

#5410 = Intermontane deep or well-drained soil scrub Group

5411 = *Grayia spinosa* (Spiny hop sage scrub) Alliance

5412 = *Krascheninnikovia lanata* (Winterfat scrubland) Alliance

5413 = *Ephedra nevadensis* (Nevada joint fir) Alliance

*5414 = *Lycium andersonii* (Anderson's boxthorn scrub) Alliance

5415 = *Salazaria mexicana* (Bladder sage scrub) Alliance

5416 = *Ericameria teretifolia* (Needleleaf rabbitbrush scrub) Alliance

5417 = *Ephedra viridis* (Mormon tea scrub) Alliance

5418 = *Lycium cooperi* (Cooper's boxthorn scrub) Provisional Alliance

5420 = Mojave and Great Basin upper bajada and toeslope Group

5421 = *Coleogyne ramosissima* (Black brush scrub) Alliance

5422 = *Purshia tridentata* (Bitter brush scrub) Alliance

5423 = *Yucca brevifolia* (Joshua tree woodland) Alliance

5424 = *Yucca schidigera* (Mojave yucca scrub) Alliance

5425 = *Menodora spinescens* (Greenfire scrub) Alliance

5430 = Southern Great Basin semi-desert grassland Group

5431 = *Achnatherum speciosum* (Desert needlegrass grassland) Alliance

*5432 = *Pleuraphis jamesii* (James' galleta shrub-steppe) Alliance

5433 = *Achnatherum hymenoides* (Indian rice grass grassland) Alliance

5440 = Intermountain shallow/calcareous soil scrub Group

5441 = *Cercocarpus ledifolius* (Curl leaf mountain mahogany scrub) Alliance

5500 = Cool Semi-Desert Alkali-Saline Wetlands Macrogroup MG082

5510 = Great Basin cool semi-desert alkali basin Group

5511 = *Sarcobatus vermiculatus* (Greasewood scrub) Alliance

6000 = NORTH AMERICAN WARM SEMI-DESERT CLIFF, SCREE AND ROCK VEGETATION DIVISION

**6100 = North American Warm Semi-Desert Cliff, Scree, and Other Rock Vegetation
Macrogroup MG117**

6110 = North American warm desert bedrock cliff and outcrop Group

6111 = Atriplex hymenelytra (Desert holly scrub) Alliance

**6112 = Ephedra funerea (Death Valley joint fir scrub) Alliance*

6113 = Mud Hills sparsely vegetated ephemeral herbs Mapping Unit

6114 = Unvegetated wash and river bottom Mapping Unit

6115 = Massive sparsely vegetated rock outcrop Mapping Unit

6116 = Sparsely vegetated playa (Ephemeral annuals) Mapping Unit

*6117 = Chorizanthe rigida - Geraea canescens (Spiny herb - Desert gold) Desert
Pavement Sparsely Vegetated Alliance*

6118 = Peucephyllum schottii (Desert fir) Alliance

#6120 = North American warm desert dunes and sand flats Group

6121 = Dicoria canescens - Abronia villosa (Desert dunes) Alliance

6122 = Panicum unvilleanum (Desert panic grass patches) Alliance

6123 = Wislizenia refracta (Spectacle fruit) Special Stands

9000 = MISCELLANEOUS CLASSES

9200 = Agriculture

9210 = Woody Agriculture (orchards, vineyards)

9220 = Non-woody Row and Field Agriculture

9300 = Built-up & Urban Disturbance

9310 = Urban Window

9320 = Anthropogenic areas of little or no vegetation

APPENDIX B

Field Reconnaissance Datasheet

RECON FIELD FORM (Feb 19, 2014)
Johnson Valley

Date:		Surveyors (circle recorder):							
Waypoint ID:		GPSname: Projected? Yes / No / Base If yes, enter base Waypoint ID: Bearing: _____ (degrees) Distance: _____ (meters)							
UID:		Base UTM's / projected UTM's (circle one) UTME _____ UTMN _____ PDOP: +/- Elev.(m)							
Size of stand (acres): <1 1-10 >10 Camera/Photos:									
Field alliance name:									
Comments:									
% Cover - Conifer Tree: Hardwood tree: Joshua Tree: Tree: Shrub: Herb:									
Strata	Species	% cover	Strata	Species	% cover	Strata	Species	% cover	
Exotics		None or not visible	1	2	3	Not Applicable			
Development		None or not visible	1	2	3	Not Applicable			
Anthropogenic Alteration		None or not visible	1	2	3	Not Applicable			
Roadedness		None or not visible	1	2	3	Not Applicable			
Hydrologic Modification		NO	YES	Not Applicable					
Date:		Surveyors (circle recorder):							
Waypoint ID:		GPSname: Projected? Yes / No / Base If yes, enter base Waypoint ID: Bearing: _____ (degrees) Distance: _____ (meters)							
UID:		Base UTM's / projected UTM's (circle one) UTME _____ UTMN _____ PDOP: +/- Elev.(m)							
Size of stand (acres): <1 1-10 >10 Camera/Photos:									
Field alliance name:									
Comments:									
% Cover - Conifer Tree: Hardwood tree: Joshua Tree: Tree: Shrub: Herb:									
Strata	Species	% cover	Strata	Species	% cover	Strata	Species	% cover	
Exotics		None or not visible	1	2	3	Not Applicable			
Development		None or not visible	1	2	3	Not Applicable			
Anthropogenic Alteration		None or not visible	1	2	3	Not Applicable			
Roadedness		None or not visible	1	2	3	Not Applicable			
Hydrologic Modification		NO	YES	Not Applicable					

APPENDIX C

Field Reconnaissance Protocol

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
PROTOCOL FOR RECONNAISSANCE FIELD FORM

(February 12, 2014)

Introduction

This protocol describes the methodology for the reconnaissance technique as recorded in the Reconnaissance Field Form dated February 19, 2014. Reconnaissance surveys are complementary to relevés and rapid assessments, but collect only a small subset of the data gathered using the more detailed methods. Reconnaissance surveys 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 protocols at www.cnps.org.

Definitions of fields in the form

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION

Date: Date of the sampling.

Surveyors: The full names 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. Please note: The person recording the data on the form should circle their name/initials.

Waypoint ID: The waypoint number assigned by a Global Positioning System (GPS) unit when marking and storing a waypoint for the sample location.

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

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

Projected? Yes / No / Base: 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 surveyor is in the vegetation they are describing and the point is where the observer was standing for photographs and soil samples, if completed. 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 description associated with this location.

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

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

Base UTM / projected UTM: if the point is projected, circle whether the UTM coordinates of the base point or the projected point have been recorded. These will generally be for the projected point.

UTM coordinates: Easting (UTME) and northing (UTMN) location coordinates using the Universal Transverse Mercator (UTM) grid. Record in writing the information from a GPS unit.

UTM zone: Universal Transverse Mercator zone. Zone 10 is for California west of the 120th longitude, zone 11 is for California east of 120th longitude, which is the same as the straight portion of California's eastern boundary.

PDOP: ± The accuracy of the GPS location, when taking the UTM field reading using positional dilution of precision (pdop).

Elev.: Recorded, in meters, from the GPS unit.

Size of stand (acres): 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.

Camera/Photos: Write the name camera, JPG number, and direction of photos. *Take four photos in the main cardinal directions (N, E, S, W) clockwise from the north, from the GPS location.* If additional photos are taken in other directions, please note this information on the form.

II. HABITAT AND VEGETATION DESCRIPTION

Field alliance name: Name of alliance following the most recent Manual of California Vegetation (Sawyer J.O., Keeler-Wolf T., and Evens, J. 2009), using scientific nomenclature, *e.g., Quercus agrifolia*. An alliance is based on the dominant or diagnostic species of the stand, and is usually of 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 Tree: 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 vegetation cover, disregarding the overlap¹ of the various tree, shrub, and/or herbaceous layers and species.

Hardwood Tree: 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 vegetation cover, disregarding the overlap¹ of the various tree, shrub, and/or herbaceous layers and species.

Joshua Tree: The total cover of all the Joshua trees taking into consideration the porosity, or the holes, in the vegetation. This is an estimate of the absolute vegetation cover, disregarding the overlap² of the various tree, shrub, and/or herbaceous layers and species.

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 vegetation cover, disregarding the overlap³ of the various tree, shrub, and/or herbaceous layers and species.

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 vegetation cover, disregarding the overlap⁴ of the various tree, shrub, and/or herbaceous layers and species.

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 vegetation cover, disregarding the overlap⁵ of the various tree, shrub, and/or herbaceous layers and species.

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.

² 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.

³ 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.

⁴ 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.

⁵ 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

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.

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.

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.

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.

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/E/A	Quercus douglasii	40/<1/<1	

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.

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.

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, the “C” in the collection column should be crossed out. If the specimen is kept but is still not confidently identified, add a “U” to the “C” in the collection column (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” in the collection column (CC = Collected and confirmed).

Disturbances

Exotic: Estimate the level of impact by exotic invasive species broken into the following classes

None or not visible

1: Low impact from exotics or patches of exotics visible, but cover not significant (relative cover to total < 33%)

2: Moderate impact from exotics or exotics (particularly herbaceous) significant and cover may exceed dominant vegetation strata (rc < 66%)

3: High impact from exotics or stand characterized by exotics (veg type is exotic) (rc > 66)

Not Applicable: used when map unit is an anthropogenic type.

Development: Estimate the level of impact by structures (buildings, tanks, paved parking lots, trailers, utility and mining structures) and anthropogenic debris (junked vehicles, trash, collapsed structures). This is for areas where low mmu settlement cannot be pulled out, or the development does not meet the criteria of a settlement.

None or not visible

- 1: Low impact from development or less than 2% of polygon affected
- 2: Moderate impact from development or between 3%- 5%of the polygon affected
- 3: High impact from development or > 5% of polygon affected

Not Applicable: used when map unit is an anthropogenic type.

Anthropogenic Alterations: Level of impact on vegetation by anthropogenic clearing of vegetation through tillage, scraping, grazing, etc.. Fire effects are not considered in this category. This captures past disturbances in the landscape still visible through their impact on vegetation when the impact is not significant enough to be a “line-former” based on its effect on woody or herbaceous cover-class or shift in vegetation type. This attribute can also be used when small-scale effects are present that may cause a break in cover class, but this break affects an area less than the mmu rule for the vegetation in question.

None or not visible

- 1: Low impact from anthropogenic alterations or less than 33% of polygon affected and/or impact is seen but not affecting veg. density (as broken down here) or type
- 2: Moderate impact from anthropogenic alterations or between 33%-66% of the polygon affected
- 3: High impact from anthropogenic alterations > 66% of polygon affected

Not Applicable: used when map unit is an anthropogenic type

Roadedness: Estimate the level of impact by paved and unpaved road, OHV trails, railroads etc.. Impact is defined by proportion of any polygon of vegetation that has. This is broken into the following classes:

None or not visible

- 1: Low impact from roads or least 2/3 (67 to 100%) of vegetation polygon area unroaded by any type of road or ohv track; large portions unroaded
- 2: Moderate impact from roads or between 1/3 and 2/3 (33 to 66%) of vegetation polygon is intersected by any type of road or ohv track
- 3: High impact from roads or < 33 % of vegetated polygon lacks roads of any kind

Not Applicable: used when map unit is an anthropogenic type.

Hydrologic Modification (yes/no): Is the vegetation stand modified by a hydrologic impediment? This is used to tag stands of desert vegetation that have their extent directly impacted by restricted sheet flow or active channel flow crossing under a road, railroad, levee, etc.. Examples include: 1) where washes have expanded on the upslope side or contracted on the downslope side of the impediment (typically a berm or levee). Where railroad or highway

berms have eliminated natural sheet flow downslope across alluvial fans and bajadas, or other slopes, and where the effect creates a line-former break such as in vegetation type, shrub cover, tree cover, or herbaceous cover. Only attributed to polygon down-slope of impediment. Drainage ditches conveying flow off the side of a road (though often visible on imagery) are not considered unless they form a line-forming break in the vegetation.