SOUTHERN SIERRA NEVADA FOOTHILLS VEGETATION SAMPLING

Agreement # P1484003

By
Jaime Ratchford, Jennifer Buck-Diaz, and Julie Evens

Of the

CALIFORNIA
NATIVE PLANT SOCIETY

2707 K Street, Suite 1
Sacramento CA, 95816

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Abstract

The California Native Plant Society, contracted by the California Department of Fish and Wildlife (CDFW), collected vegetation data within the Southern Sierra Nevada Foothills (SSNF), which will be used to develop a hierarchical vegetation classification and a fine-scale vegetation map of the region in future projects. Using the CNPS-CDFW Protocol for Combined Vegetation Rapid Assessment and Relevé Sampling, CNPS and partners coordinated with landowners and land managers, obtained land access permits, and collected over 700 surveys including 510 rapid assessment surveys and 202 relevé plots. We conducted field surveys across two spring seasons between April 2015 and April 2016, and these surveys represented more than 115 vegetation types. The field data was entered into the CDFW/CNPS joint SQL database and has been thoroughly quality controlled by the CNPS staff.

Acknowledgments

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Introduction

The California Native Plant Society was contracted by the California Department of Fish and Wildlife (CDFW) to create and execute a strategy to sample vegetation of the Southern Sierra Nevada Foothills (SSNF). The collected vegetation data will be used along with previously collected data from the region to develop a hierarchical vegetation classification, which will meet the standards of the Survey of California Vegetation (SCV) and National Vegetation Classification System (NVCS) (FGDC 2008). The classification will be the foundation of an accurate fine-scale vegetation map of the SSNF that will allow detailed assessment of plant, vegetation and wildlife habitat resources.

The project objectives included the development and execution of a sampling plan to adequately collect vegetation data across the range and variability of vegetation in the SSNF project area (Figure 1). The project area covers 1,771,290 acres of the southern portion of the Sierra Nevada Foothills Section as defined by the USDA's Ecological Subsections of California (Miles and Goudey 1997). The area covers from the east and south side of the San Joaquin Valley (SJV) floor upward largely below 2,500 ft. elevation (with the exception of the San Emigdio Mountains with higher elevation). The SSNF is of particular interest for inventory because it, along with the northern Sierra Nevada Foothills (mapped previously) and the SJV (being mapped separately), have the potential for the greatest increase in urban, suburban, and rural residential development within California. Previous to this current project, approximately 1,000 vegetation surveys had been collected in the ecoregion under a separate CDFW contract and other CNPS projects beginning in 2008 (see point locations in Figure 1). The sampling undertaken in this current project fills in gaps of information and additional samples for a number of vegetation types or locations that were missed or under-sampled during that earlier period. CNPS, along with partners at Vollmar Natural Lands Consulting (VNLC), provided logistical and botanical expertise to collect and enter field data focused upon natural and semi-natural stands of vegetation in the SSNF ecoregion.

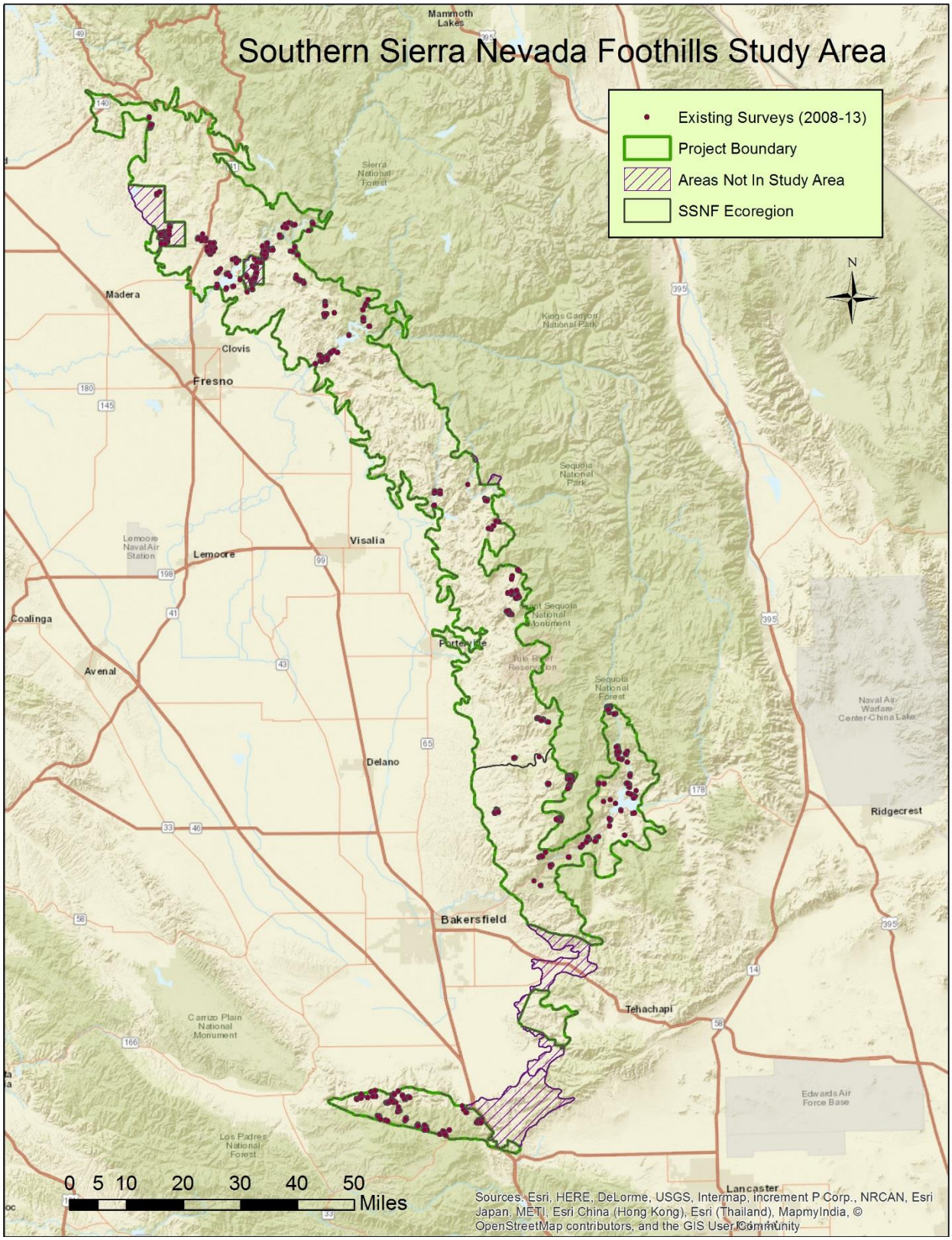

Figure 1. The Southern Sierra Nevada Foothills Study Area

Methods

In early 2015, CNPS coordinated a kick-off meeting with CDFW staff and VNLC to discuss details of the project and to obtain project materials including digital GIS layers (study area boundaries, previous plot data and locations, and existing vegetation maps), access to the SQL database (in MS Access format), an ArcPad template for field data collection, and a permission to access form. CDFW also provided a preliminary list of vegetation types in SSNF and a gradient directed transect (GRADSECT) analysis, which partitions the project area into focused sampling areas called unique bio-physical units (BPU's), based on environmental factors such as climate and slope.

Beginning in the early spring of 2015, CNPS and VNLC staff contacted landowners of private lands and land managers of public lands and with land trusts and other conservation groups to obtain access to lands for surveys. CNPS and VNLC worked collaboratively to identify private and public lands that were a priority for access and field inventory, as determined by the existing GRADSECT analysis and the preliminary vegetation classification. Access efforts focused on large parcels, locations with diverse vegetation patterns, and areas with un- or under-sampled vegetation types. Written permission was obtained to access all lands, public and private. For all private lands, written permission was obtained using the permission to access form (Appendix 3).

CNPS compiled numerous layers of existing GIS data provided by CDFW, which were displayed on an online viewer established by Mark Tukman of Tukman Geospatial LLC. This online viewer was the platform for land access planning and eventually, in conjunction with Esri's Collector App for iPads, geospatial data collection by field crews.

CNPS and VNLC developed a sampling strategy for the SSNF study area, which included sampling locations, expected number of samples, and timing for the 2015 field seasons. In order to ensure adequate sampling of the range and variability of vegetation in the study area, the sampling plan was based on land accessibility, the GRADSECT analysis, the preliminary list of vegetation types, and the number of existing surveys for each type from earlier projects in the region. The preliminary list of vegetation types was used throughout the project to track the vegetation types sampled during each week of field surveys, and to track the number of surveys per ecoregion subsection. New vegetation types were added to the list when they were found to be repeating in the study area. The GRADSECT was also updated regularly to identify BPU's that needed additional surveys.

In late March 2015, field staff received a training on the CNPS-CDFW Protocol for Combined Vegetation Rapid Assessment and Relevé Sampling provided by CNPS ecologists and CDFW senior vegetation ecologist. Prior to the 2015 and 2016 field seasons, CNPS and VNLC staff met in the field to calibrate on ocular cover estimation.

Field sampling took place during two field seasons, specifically April to June 2015 and March to April 2016, with a goal of conducted 500 vegetation rapid assessments and 100 relevé plots. During the 2015 field season, CNPS field staff consisted of three team leaders and three vegetation assistants and VNLC field staff consisted of 3 ecologists. Two-person teams (each consisting of a team leader and vegetation assistant for CNPS, and one to three ecologists for VNLC) traveled to different regions of the study area for sampling. The CNPS-CDFW Protocol

for Combined Vegetation Rapid Assessment and Relevé Sampling was used to conduct the field surveys (Appendix 1).

Field staff created electronic PDF scans of the datasheets and filed the hard-copy data in binders; downloaded GPS data and reviewed it for positional accuracy; and downloaded digital photographs taken during surveys and organized them into folders named with their respective survey number. CNPS staff entered the 2015–2016 field data into the CDFW/CNPS joint SQL database.

CNPS staff compiled and organized plant specimens collected during surveys. Specimens with at least 1% cover were prioritized for identification. CNPS staff took specimens to the UC Davis Herbarium and used the facility to identify the specimens. Identification information was updated on datasheets and in the database. Some plant specimens were selected for accession to a herbarium.

All data entered was thoroughly quality controlled by the CNPS Data Coordinator. This included sorting fields within the database to check for outlier values in the data and custom queries to summarize and validate plant species identifications. Survey locations were thoroughly reviewed for accuracy and to insure they fell within the boundaries of lands we had permission to access.

Results

CNPS and VNLC coordinated with land managers and landowners including Army Corps of Engineers, Bureau of Reclamation, California Rangeland Trust, Kaweah Delta Water Conservation District, National Audubon Society, Sequoia Riverlands Trust, Sierra Foothills Conservancy, Tejon Ranch Conservancy, The Nature Conservancy, US Forest Service, Bureau of Land Management, California State Parks, county agencies and private land owners regarding land access permission. We regularly used an excel spreadsheet to document names/entities and notes regarding land access per property, and we often updated the ArcGIS Online Viewer to display areas/properties where we had scheduled specific weeks for field surveying. In sum, we gained access to more than 600,000 acres of land. Signed permission forms were scanned electronically as PDFs and have been archived on the CDFW VegCAMP server.

CNPS and VNLC staff conducted 712 vegetation rapid assessment and relevé surveys across both field seasons in the southern Sierra Nevada Foothills (Figure 2). Of those surveys, 202 were herbaceous relevé surveys. Because 2015 was a drought year (upon 3 successive years of prior drought), we were unsatisfied with the number and diversity of surveys we were able to collect. Some landowners were hesitant to provide access to their lands in 2015 because of their dry site conditions. Since more rainfall was predicted for 2016, we returned to the field in March–April 2016 to collect an additional 92 surveys, of which 71 were relevés. Out of the 712 surveys, 102 fell outside of the CDFW project area; 72 of these surveys were collected at Tejon Ranch, which was previously excluded from the project area, though it is within the ecoregion boundary. The other 30 surveys were also in areas excluded from the CDFW project area because they were in areas of a separate, discrete mapping project within the ecoregion or they fell within a 1 km buffer of the ecoregion boundary.

Overall during the two field seasons, 118 vegetation types were surveyed including 25 tree types (Table 1), 53 shrub types (Table 2), and 40 herbaceous types (Table 3). We were able to survey an additional 18 unique bio-physical units that had not previously been surveyed for the region. Sixty-three surveys were collected across these BPUs. The GRADSECT was updated to reflect the number of surveys within a unique BPU. The data collected for this project also were added to the existing CNPS and CDFW data for the ecoregion for a total of 1,759 surveys.

The location of each survey was marked using a GPS device and photos were taken for surveys. Photos have been sorted and archived on the CDFW server with the exception of one plot, SSNF2190 which is missing its photos. Mark Tukman of Tukman Geospatial LLC has updated the ArcGIS Online Viewer (http://cnps.maps.arcgis.com/apps/webappviewer/index.html?id=f40f49976ce941f492b8255bd0317eae) with all the survey points taken during this 2015 – 2016 project effort and has attached the respective photos to each survey point in the attribute fields. The photos are viewed by clicking the link for each photo in the attribute table.

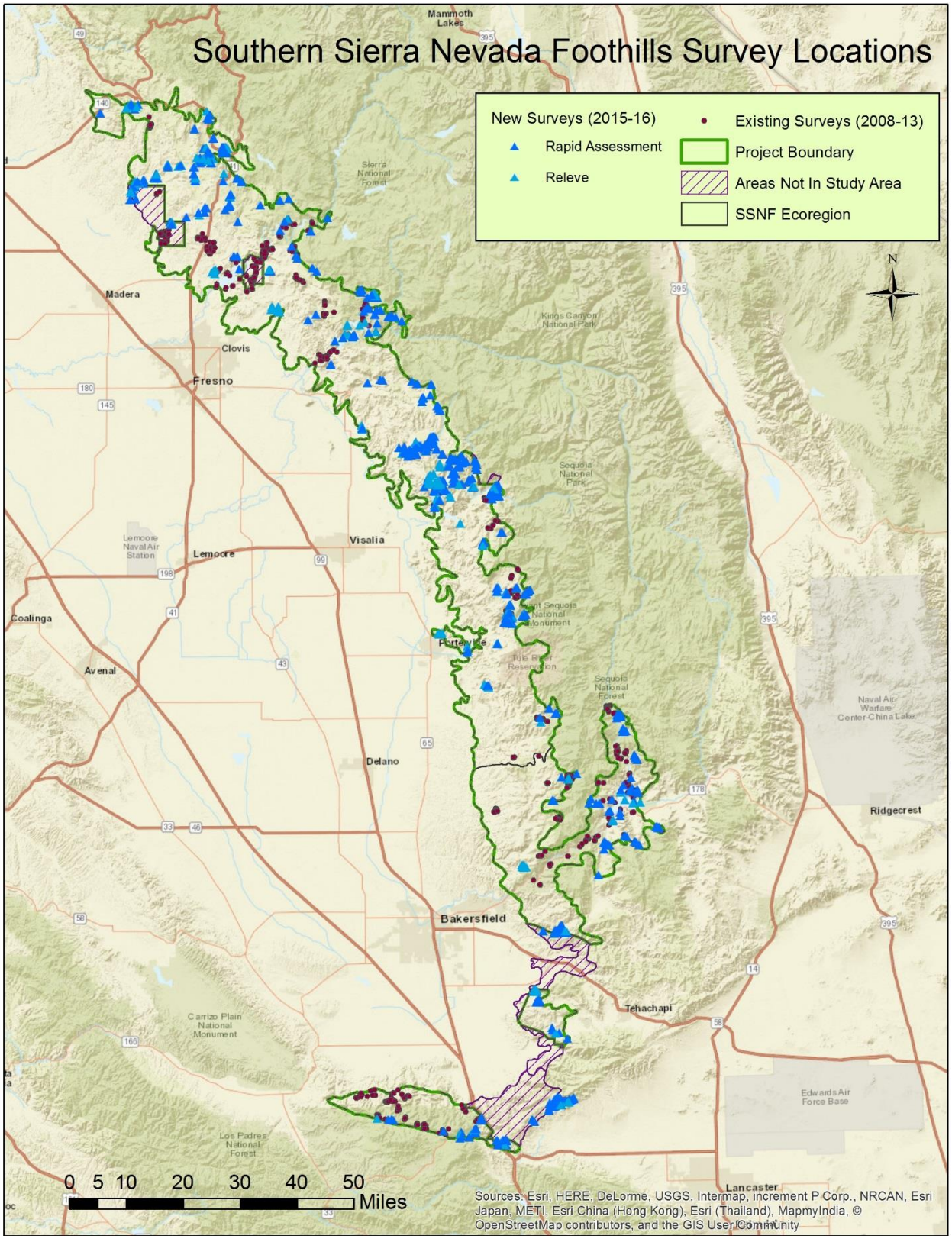

Figure 2. Location of field vegetation surveys collected during the 2015-2016 field seasons in the Southern Sierra Nevada Foothills study area.

Table 1. Field Alliances (vegetation types) surveyed during the 2015 and 2016 field season listed by tree species. The number of samples surveyed are listed for the Sierra Nevada Foothills ecoregion by subsection. Subsection M261Fc refers to the Lower Granitic Foothills, subsection M261Fd refers to the Southern Granitic Foothills, and subsection M261Fe refers to the San Emigdio Mountains.

Field Alliance	M261Fc	M261Fd	M261Fe
Abies concolor	0	0	1
Aesculus californica	19	0	0
Alnus rhombifolia	11	3	0
Calocedrus decurrens	0	1	0
Fraxinus latifolia	6	0	0
Hesperocyparis nevadensis	0	2	0
Juglans hindsii and Hybrids	2	0	0
Juniperus californica	0	4	0
Pinus jeffreyi	0	0	1
Pinus monophylla	0	2	3
Pinus ponderosa	5	1	0
Pinus ponderosa-Calocedrus decurrens	2	0	0
Pinus sabiniana	3	5	0
Platanus racemosa	13	2	0
Populus fremontii	3	1	0
Quercus (agrifolia, douglasii, garryana, kelloggii, lobata, wislizeni)	0	1	0
Quercus chrysolepis (tree)	17	3	5
Quercus douglasii	37	2	0
Quercus kelloggii	9	1	2
Quercus lobata	14	2	4
Quercus wislizeni (tree)	28	4	0
Salix gooddingii	3	1	0
Salix laevigata	5	3	1
Umbellularia californica	7	0	0
Yucca brevifolia	0	0	1

Table 2. Field Alliances (vegetation types) surveyed during the 2015 and 2016 field season listed by shrub species. The number of samples surveyed are listed for the Sierra Nevada Foothills ecoregion by subsection. Subsection M261Fc refers to the Lower Granitic Foothills, subsection M261Fd refers to the Southern Granitic Foothills, and subsection M261Fe refers to the San Emigdio Mountains.

Field Alliance	M261Fc	M261Fd	M261Fe
Adenostoma fasciculatum	13	1	0
Arctostaphylos glandulosa	0	0	1
Arctostaphylos glauca	0	2	1
Arctostaphylos parryana	0	0	3
Arctostaphylos viscida	17	0	0
Artemisia tridentata	0	2	3
Adenostoma fasciculatum	13	1	0

Field Alliance	M261Fc	M261Fd	M261Fe
Arctostaphylos glandulosa	0	0	1
Arctostaphylos glauca	0	2	1
Arctostaphylos parryana	0	0	3
Arctostaphylos viscida	17	0	0
Artemisia tridentata	0	2	3
Atriplex polycarpa	0	1	0
Baccharis salicifolia	3	1	0
Broom (*Cytisus scoparius* and Others)	1	0	0
Carpenteria californica Special Stands	1	0	0
Ceanothus cuneatus	20	4	0
Ceanothus greggii	0	0	1
Ceanothus leucodermis	4	0	0
Cephalanthus occidentalis	5	0	0
Cercis occidentalis - Prunus spp*. - Toxicodendron diversilobum*	5	0	0
Cercocarpus ledifolius	0	0	1
Cercocarpus montanus	4	1	3
Diplacus aurantiacus	8	3	0
Encelia (actoni, virginensis)	0	3	0
Ephedra viridis	0	1	2
Ericameria cuneata	1	0	0
Ericameria linearifolia – Isomeris arborea	0	3	0
Ericameria nauseosa	0	6	3
Eriodictyon californicum	15	2	0
Eriodictyon crassifolium	0	0	1
Eriogonum fasciculatum	1	5	2
Eriogonum wrightii	0	0	2
Frangula californica	3	1	1
Fraxinus dipetala Provisional	2	0	0
Fremontodendron californicum	0	4	3
Hesperoyucca whipplei	3	3	0
Keckiella breviflora Provisiona	5	0	0
Lepidospartum squamatum	0	1	0
Lotus scoparius	4	0	0
Lupinus (excubitus)	0	0	4
Lupinus albifrons	9	0	0
Lupinus formosus var. formosus	1	0	0
Nicotiana glauca	1	0	0
Prunus fasciculata	0	1	0
Prunus virginiana	1	0	0
Quercus berberidifolia	2	0	2
Quercus garryana (shrub)	4	3	2
Quercus john-tuckeri	0	0	3
Quercus wislizeni (shrub)	8	4	2
Rhamnus illicifolia	0	1	1
Rhus trilobata	7	0	0
Ribes quercetorum	2	4	2
Ribes roezlii Provisional	1	1	0

Field Alliance	M261Fc	M261Fd	M261Fe
Rosa californica	1	0	0
Salix exigua	2	0	0
Sambucus nigra	0	1	0
Toxicodendron diversilobum	13	1	0
Vitis californica Provisional	4	0	0

Table 3. Field Alliances (vegetation types) surveyed during the 2015 and 2016 field season listed by herbaceous species. The number of samples surveyed are listed for the Sierra Nevada Foothills ecoregion by subsection. Subsection M261Fc refers to the Lower Granitic Foothills, subsection M261Fd refers to the Southern Granitic Foothills, and subsection M261Fe refers to the San Emigdio Mountains.

Field Alliance	M261Fc	M261Fd	M261Fe
Achnatherum speciosum	0	0	3
Amsinckia (menziesii, tessellata)	9	4	2
Anemopsis californica	0	1	0
Avena (barbata, fatua)	6	0	1
Brassica nigra and other mustards	2	2	1
Bromus (diandrus, hordeaceus) - Brachypodium distachyon	18	1	1
Bromus rubens - Schismus (arabicus, barbatus)	2	0	0
Bromus tectorum	0	1	1
Carex (pansa, praegracilis)	0	1	0
Carex densa Provisional	1	0	0
Centaurea (solstitialis, melitensis)	2	0	0
Corethrogyne filaginifolia	0	1	3
Cynodon dactylon - Crypsis spp. *- Paspalum* spp.	0	1	0
Distichlis spicata	0	1	0
Eleocharis macrostachya	4	0	0
Eriogonum (elongatum, nudum)	0	0	1
Eschscholzia (californica) – Lupinus (nanus)	7	0	0
Heterotheca (oregona, sessiliflora)	2	0	1
Holocarpha heermannii	15	0	0
*Juncus arcticus (*var. *balticus, mexicanus)*	4	2	1
Juncus effusus	1	0	0
Lasthenia californica - Plantago erecta - Vulpia microstachys	8	1	2
Lasthenia fremontii - Downingia (bicornuta)	1	0	0
Lemna (minor) and Relatives	1	0	0
Leymus triticoides	0	0	1
Lolium perenne	4	0	0
Lupinus benthamii - Chorizanthe membranacea	15	4	0
Madia elegans	7	0	1
Mimulus (guttatus)	5	0	0
Monolopia (lanceolata) - Coreopsis (calliopsidea)	1	0	1
Nassella cernua	2	0	0
Plagiobothrys nothofulvus	13	4	0
Poa secunda	1	1	0
Pteridium aquilinum	1	0	0

Field Alliance	M261Fc	M261Fd	M261Fe
Ranunculus aquatilis	1	0	0
Schoenoplectus acutus	2	0	0
Selaginella bigelovii	11	0	0
Sporobolus airoides	0	1	0
Trifolium variegatum	2	0	0
Typha (angustifolia, domingensis, latifolia)	3	0	0

Approximately 1,000 different plant species were recorded in the combined survey database. Over the course of this project, 408 specimens were collected and pressed for identification purposes. Sixty-five of these specimens have been submitted to three herbaria for accessioning. Thirty-two specimens collected in the Los Padres National Forest area were submitted to Rancho Santa Ana Botanic Garden, another 32 specimens were submitted to the herbarium at UC Berkeley, and four specimens were submitted to the UC Davis herbarium. There are 63 specimens still requiring confirmation. All other specimens have been identified to the finest taxonomic level possible and are currently being stored at the UC Davis herbarium.

Seven rare plant species (CNPS 1B) were identified in our surveys across both years including *Carpenteria californica, Eriogonum nudum* var. *murinum, Hesperocyparis nevadensis, Lupinus citrinus* var. *citrinus,* and *Streptanthus cordatus* var. *piutensis.* Six species on the "watch" list (CNPS 4) were encountered in our surveys including *Microseris sylvatica, Frasera neglecta, Pentachaeta fragilis, Perideridia pringlei, Streptanthus farnsworthianus,* and *Wyethia elata.* Of these taxa, *Streptanthus cordatus* var. *piutensis, Streptanthus farnsworthianus,* and *Microseris sylvatica* were submitted to the UC Davis herbarium.

Problems Encountered

CNPS and VNLC received the most recent digital GIS layers, preliminary list of vegetation types, and MS Access database later than expected in the original project timeline. Thus, CNPS did not complete a prioritized sampling strategy for the SSNF study area by March 9, 2015. Because the sampling did not begin until early April after the field staff training that occurred in late March, 2015, CNPS and VNLC were not able to collect an adequate sample of annual and perennial herbaceous samples in the most phenologically active timeframe for sampling. Thus, we prioritized additional surveys in the 2016 spring field season.

During the data quality control (QC) process, CNPS staff found that approximately 36 surveys landed within private properties where either official land access was not provided and/or or access with a fully signed permission form was not received. We have removed these data from the CDFW database, and they are not included in the count of surveys conducted.

During QC of the database, we found some recurring errors. Field alliance data sometimes did not get entered into the database. This was likely due to the data entry form not reflecting the structure and flow of the data form. We asked CDFW to edit the layout of the data entry form, which we hope will remedy this common error. During QC of the species data entry, incorrect cover values were the most common error. During data entry, percent cover is auto-filled to the default of 0.2. By having this auto-filled, it allows the data entry person to more easily overlook entering the correct percent cover when it is not 0.2. CDFW may want to consider removing the auto-fill from this field, or enable a button to automatically sum the entered cover values to cross-check accuracy of the values and compare with the overall cover by layer.

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APPENDIX

APPENDIX 1. Vegetation Relevé and Rapid Assessment protocols and field forms used for the vegetation sampling. Survey Form Code List follows after protocol.

PROTOCOL FOR COMBINED VEGETATION RAPID ASSESSMENT AND RELEVÉ SAMPLING FIELD FORM

(March 10, 2015, Southern Sierra Nevada Foothills)

Introduction

This protocol describes the methodology for both the relevé and rapid assessment vegetation sampling techniques as recorded in the combined relevé and rapid assessment field survey form for the Southern Sierra Nevada Foothills project. The same environmental data are collected for both techniques. However, the relevé sample is a plot demarcated with a measuring tape, with each species in the plot and its cover being recorded. The rapid assessment sample is not based on a taped plot, but for this project is based on a visually estimated, usually circular area within a representative portion of the entire stand, with up to 20 of the dominant or characteristic species and their cover values recorded. For more background on the relevé and rapid assessment sampling methods, see the relevé and rapid assessment protocols at www.cnps.org.

For this project, collect rapid assessments in woody vegetation and relevés in herbaceous vegetation.

Defining a Stand

A stand is the basic physical unit of vegetation in a landscape. It has no set size. Some vegetation stands are very small, such as a portion of a vernal pool, and some may be several square kilometers in size, such as forest types. All samples should be in stands that meet the minimum mapping unit of 1 acre for upland and 0.5 acre for special stands such as small wetlands, riparian and serpentine barrens.

A stand is defined by two main unifying characteristics:

1) It has *compositional* integrity. Throughout the site, the combination of species is similar. The stand is differentiated from adjacent stands by a discernable boundary that may be abrupt or indistinct.
2) It has *structural* integrity. It has a similar history or environmental setting that affords relatively similar horizontal and vertical spacing of plant species. For example, a hillside forest originally dominated by the same species that burned on the upper part of the slopes, but not the lower, would be divided into two stands. Likewise, sparse woodland occupying a slope with very shallow rocky soils would be considered a different stand from an adjacent slope with deeper, moister soil and a denser woodland or forest of the same species.

The structural and compositional features of a stand are often combined into a term called *homogeneity*. For an area of vegetated ground to meet the requirements of a stand, it must be homogeneous (uniform in structure and composition throughout).

Selecting a bounded plot (relevé) or representative area (rapid assessment) to sample within a stand

Stands to be sampled may be selected by evaluation prior to a site visit (*e.g.,* from aerial photos) or they may be selected on site during reconnaissance to determine extent and boundaries, location of other similar stands, etc.

Because many stands are large, it may be difficult to summarize the species composition, cover, and structure of an entire stand. We are also usually trying to capture the most information as efficiently as possible. Thus, we are typically forced to select a representative portion to sample.

When sampling a stand of vegetation, the main point is to select a sample that, in as many ways possible, is representative of that stand. This means that you are not randomly selecting a plot; on the contrary, you are actively using your own best judgment to find a representative example of the stand.

Selecting a relevé plot or rapid assessment area requires that you see enough of the stand you are sampling to feel comfortable in choosing a representative plot location. Take a brief walk through the stand and look for variations in species composition and in stand structure. In many cases in hilly or mountainous terrain look for a vantage point from which you can get a representative view of the whole stand. Variations in vegetation that are repeated throughout the stand should be included in your plot. Once you assess the variation within the stand, attempt to find an area that captures the stand's common species composition and structural condition to sample.

Tracking sampled vegetation types

For large projects, the number of samples should be tracked daily or weekly by field-assessed alliance type so that samples are spread as evenly as possible over types and time is not wasted collecting excessive numbers of samples of certain types. When multiple teams are in the field in the same week, daily communication between teams about alliances sampled can ensure even sampling*. Prior to selecting a stand to sample, determine if what you are going to sample is needed based on this alliance tracking.*

Selecting plots to avoid spatial autocorrelation

When possible, do not sample adjacent stands. Do not take more than one sample of the same vegetation type within a sub-watershed. Exceptions can be made due to limited access to private lands. For example, samples from different formations, subclasses or classes (e.g., wetlands vs. uplands, lithomorphic vs. mesomorphic) may be sampled in the same sub-watershed, however, avoid sampling a grassland adjacent to an open woodland, even though they are technically different formations.

Plot Size

For this project, the relevé plot size is 100 m^2. In very few cases, such as vernal pools, plot size can be less (10 m^2).

Plot Shape

A relevé has no fixed shape, though plot shape should reflect the character of the stand and are either squares or rectangles. Adjust the orientation and dimensions of the plot to incorporate the best approximation of stand homogeneity. If the stand is about the same size as a relevé, the plot boundaries may be similar to that of the entire stand. If we are sampling streamside riparian or other linear communities, our plot dimensions should not go beyond the community's natural ecological boundaries. Thus, a relatively long, narrow plot capturing the vegetation within the stand, but not outside it would be appropriate. Species present along the edges of the plot that are clearly part of the adjacent stand should be excluded from the plot.

Location of GPS Points

For relevés, one corner will be considered the plot Identifier (ID point) and should be in the SW corner, if possible. If it is taken in another corner, this should be noted in the Site history section.

Definitions of fields in the protocol

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION

Relevé or RA: Circle the appropriate survey type.

Database #: This is the unique ID number for or all relevé and rapid assessments, in the form of SSNFxxxx.

Date: Date of the sampling.

Name of 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 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.

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 each GPS unit. This can be the serial number if another number is not assigned.

Bearing°, left axis at ID point of Long / Short side: Fill this in for relevés only. For square or rectangular plots: from the Identifier Point corner, looking towards the plot, record the bearing of the axis to your left. If the plot is a rectangle, indicate whether the left side of the plot is the long or short side of the rectangle by circling "long" or "short" side (no need to circle anything for square plots). If there are no stand constraints, set up the plot with boundaries running in the cardinal directions and place the Identifier Point in the SW corner.

UTM coordinates: Easting (UTME) and northing (UTMN) location coordinates using the Universal Transverse Mercator (UTM) grid. Record the information from your GPS unit. These coordinates are always the base point of the survey. Soil samples and photos are taken from this point, and exposure, steepness, topography, etc. are measured here. If the GPS is not within the stand (i.e., the point is projected), these are the UTMs of the base point.

For relevé plots, take the waypoint in the southwest corner of the plot whenever possible or in the center of a circular plot.

GPS error: ft./ m./ PDOP: Circle the appropriate unit of measure and record the error reading from the GPS unit.

Decimal degrees: Use this only if your GPS unit will not record UTM coordinates. Latitude–Longitude reading in decimal degrees. Record the information from your GPS unit. These coordinates are always the base point of the survey. Soil samples and photos are taken from this point, and exposure, steepness, topography, etc. are measured here.

For relevé plots, take the waypoint in the southwest corner of the plot whenever possible or in the center of a circular plot.

GPS within stand? Yes / No: Circle "Yes" to denote that the GPS waypoint was taken directly within or at the edge of the stand being assessed for a rapid assessment, or circle "No" if the waypoint was taken at a distance from the stand (such as with a binocular view of the stand). If the point is taken at the edge of the stand, note the direction to the stand.

If No, cite from GPS to stand: distance (m), bearing°, inclination°: From the base GPS point, measure the distance to the projected point using a range finder. Record the compass bearing from the base point to the projected point; record the inclination if the base and projected points are not at the same elevation.

and record projected UTMs: These are the coordinates of the projected point, or the point being surveyed. They are generated in the field if the GPS units have the ability to calculate projected points. If the GPS unit does not have this capability, make a note to that effect and leave these fields blank.

Camera Name: Write the camera name.

Cardinal photos at ID point: Take four photos in the main cardinal directions (N, E, S, W) clockwise from the north, from the ID Point and record the jpeg numbers here. Try to include the horizon in at least some of these photos. If this is a distance survey to a projected point, take the four cardinal photos at the base point and at least one photo of the stand.

Other photos: This may include cardinal photos at additional corners or other relevant photos. Notes regarding photo locations or subjects can go here.

Stand Size: Estimate the size of the entire stand in which the sample is taken. As a measure, one acre is about 4000 square meters (approximately 64 x 64 m), or 208 feet by 208 feet. One acre is similar in size to a football field.

Plot Size: If this is a relevé, circle "100" for a $100m^2$ plot, or record the plot size.

Plot Shape: Record the length and width of the relevé plot in meters.

RA Radius: Enter the radius of the visually estimated sample area for rapid assessments (should be a 20 meter radius minimum). For a large stand, this limits the area covered by the RA. If you can see and assess the entire stand, the length and width should be recorded. If it is a long, narrow stand, note the width of the stand at your location. If your point is on the edge of the stand, record the radius into the stand, but note your location and the direction to which the RA Radius applies in the Site History section.

Exposure: (Enter actual º and circle general category): While facing in the general downhill direction, read degrees of the compass for the aspect or the direction you are standing, using degrees from north, adjusted for declination. Average the reading over the entire stand, even if you are sampling a relevé plot, since your plot is representative of the stand. If estimating the exposure, write "N/A" for the actual degrees, and circle the general category chosen. "Variable" may be selected if the same, homogenous stand of vegetation occurs across a varied range of slope exposures. Select "all" if stand is on top of a knoll that slopes in all directions or if the same, homogenous stand of vegetation occurs across all ranges of slope.

Steepness: (Enter actual º and circle general category): Read degree slope from your compass. If estimating, write "N/A" for the actual degrees, and circle the general category chosen. Make sure to average the reading across the entire stand even if you are sampling in a relevé plot.

Topography: First assess the broad (**Macro**) topographic feature or general position of the stand in the surrounding watershed, that is, the stand is at the top, upper (1/3 of slope), middle (1/3 of slope), lower (1/3 of slope), or bottom. **Circle *all* of the positions that apply for macrotopography.**

Then assess the local (Micro) topographic features or the lay of the area (*e.g.,* surface is flat or concave). Circle only *one* of the microtopographic descriptors.

Geology code: Geological parent material of site. If exact type is unknown, use a more general category (*e.g.,* igneous, metamorphic, sedimentary). *See code list for types*.

Soil Texture code: Record soil texture that is characteristic of the site (e.g., coarse loamy sand, sandy clay loam). See soil texture key and code list for types.

Upland or Wetland/Riparian: Indicate if the stand is in upland or a wetland/riparian. (Wetland and riparian are one category.) Note that a site need not be officially delineated as a wetland to qualify as such in this context (e.g., seasonally wet meadow).

% Surface cover (abiotic substrates). The total should sum to 100%. It is helpful to imagine "mowing off" all of the live vegetation at the base of the plants and removing it – you will be estimating what is left covering the surface. Note that non-vascular cover (lichens, mosses, cryptobiotic crusts) is not estimated in this section.

% Water:	Percent surface cover of running or standing water, ignoring the substrate below the water.
% BA Stems:	Percent surface cover of the basal area of stems at the ground surface. For most vegetation types, BA is 1-3% cover.
% Litter:	Percent surface cover of litter, duff, or wood on the ground.

% Bedrock:	Percent surface cover of bedrock.
% Boulders:	Percent surface cover of rocks > 60 cm in diameter.
% Stone:	Percent surface cover of rocks 25-60 cm in diameter.
% Cobble:	Percent surface cover of rocks 7.5 to 25 cm in diameter.
% Gravel:	Percent surface cover of rocks 2 mm to 7.5 cm in diameter.
% Fines:	Percent surface cover of bare ground and fine sediment (*e.g.,* dirt) < 2 mm in diameter.

% Current year bioturbation: Estimate the percent of the sample or stand exhibiting soil disturbance by any organism that lives underground. Do not include disturbance by ungulates. Note that this is a separate estimation from surface cover.

Past bioturbation present? Circle Yes if there is evidence of bioturbation from previous years.

% Hoof punch: Note the percent of the sample or stand surface that has been punched down by hooves (cattle or native grazers) in wet soil.

Fire Evidence: Circle Yes if there is visible evidence of fire, and note the type of evidence in the "Site history, stand age and comments section," for example, "charred dead stems of *Quercus berberidifolia* extending 2 feet above resprouting shrubs." If you are certain of the year of the fire, put this in the Site history section.

Site history, stand age, and comments: Briefly describe the stand age/seral stage, disturbance history, nature and extent of land use, and other site environmental and vegetation factors, such as distribution of species. Examples of disturbance history: fire, landslides, avalanching, drought, flood, animal burrowing, or pest outbreak. Also, try to estimate year or frequency of disturbance. Examples of land use: grazing, timber harvest, or mining. Examples of other site factors: exposed rocks, soil with fine-textured sediments, high litter/duff build-up, multi-storied vegetation structure, or other stand dynamics.

Disturbance code / Intensity (L,M,H): List codes for potential or existing impacts on the stability of the plant community. See code list for impacts and definitions of levels of disturbance. Characterize each impact each as **L** (=Light), **M** (=Moderate), or **H** (=Heavy). Disturbance is evaluated on a stand basis.

II. HABITAT AND VEGETATION DESCRIPTION

CALIFORNIA WILDLIFE-HABITAT RELATIONSHIPS (CWHR)

For CWHR, identify the size/height class of the stand using the following tree, shrub, and/or herbaceous categories. These categories are based on functional life forms.

Tree DBH: Circle one of the tree size classes provided when the tree canopy closure exceeds 10 percent of the total cover, or if young tree density indicates imminent tree dominance. Size class is based on the average diameter at breast height (dbh) of each trunk (standard breast height is 4.5ft or 137cm). When marking the main size class, make sure to estimate the mean diameter of all trees over the entire stand, and weight the mean toward the larger tree dbh's.

The "**T6 multi-layered**" dbh size class contains a multi-layered tree canopy (with a size class T3 and/or T4 layer growing under a T5 layer and a distinct height separation between the classes) exceeding 60% total cover. Stands in the T6 class need also to contain at least 10% cover of size class 5 (>24" dbh) trees growing over a distinct layer with at least 10% combined cover of trees in size classes 3 or 4 (>11-24" dbh).

Shrub: Circle one of the shrub size classes provided when shrub canopy closure exceeds 10 percent (except in desert types) by recording which class is predominant in the survey. Shrub size class is based on the average amount of crown decadence (dead standing vegetation on live shrubs when looking across the crowns of the shrubs).

Herb: Circle one of the herb height classes when herbaceous cover exceeds 2 percent by recording the predominant class in the survey. Note*: This height class is based on the average plant height at maturity, not necessarily at the time of observation.*

INTERPRETATION OF STAND

Field-assessed vegetation alliance name: Enter the name of alliance following the Manual of California Vegetation, 2nd Edition (Sawyer, Keeler-Wolf and Evens 2009). Please use scientific nomenclature, *e.g., Quercus agrifolia* forest. 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.

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. If this is the case, also make sure to state that it is not in the MCV under the explanation for "Confidence in alliance identification."

Field-assessed association name (optional): Enter the name of the species in the alliance and additional dominant/diagnostic species from any strata. In following naming conventions, species in differing strata are separated with a slash, and species in the uppermost stratum are listed first (*e.g., Quercus douglasii/Toxicodendron diversilobum*). Species in the same stratum are separated with a dash (*e.g., Quercus lobata-Quercus douglasii)*.

The field-assessed association name may not exist in the present classification, in which you can provide a new association name in this field.

Adjacent Alliances/direction: Identify other vegetation types that are directly adjacent to the stand being assessed by noting the dominant species (or known type). Also note the distance away in meters from the GPS waypoint and the direction in degrees aspect that the adjacent alliance is found

(*e.g., Amsinckia tessellata* / 50m, 360° N *Eriogonum fasciculatum* /100m, 110°).

Confidence in Identification: (L, M, H) With respect to the "field-assessed alliance name," note whether you have L (=Low), M (=Moderate), or H (=High) confidence in the interpretation of this alliance name.

Explain: Please elaborate if your "Confidence in Identification" is low or moderate. Low confidence can occur from such things as a poor view of the stand, an unusual mix of species

that does not meet the criteria of any described alliance, or a low confidence in your ability to identify species that are significant members of the stand.

Phenology: Indicate early (E), peak (P) or late (L) phenology for each of the strata. For herbs, this generally indicates if species are in flower and/or fruit and are therefore identifiable. For shrubs and trees, this attribute generally refers to cover, e.g., a tree that is fully leafed out will be considered peak (P) even if it is not in flower. Phenology is useful for cover estimation and species identification issues, and should be elaborated upon in the next field.

Other identification problems or mapping issues: Discuss any further problems with the identification of the assessment or issues that may be of interest to mappers.

OVERALL COVER OF VEGETATION

Provide an estimate of cover for the life-form categories below. Record a specific number for the total aerial cover or "bird's-eye view" looking from above for each category, estimating cover for the living plants only. Litter/duff should not be included in these estimates.

The *porosity* of the vegetation should be taken into consideration when estimating percent foliar cover for all categories below: consider how much of the sky you can see when you are standing under the canopy of a tree, or how much light passes through the canopy of the shrub layer to help you estimate foliar cover.

% NonVasc cover: The total cover of all lichens, bryophytes (mosses, liverworts, hornworts), and cryptogamic crust on substrate surfaces including downed logs, rocks and soil, but not on standing or inclined trees or vertical rock surfaces.

% Vasc Veg cover: The total cover of all vascular vegetation taking into consideration the porosity, or the holes, in the vegetation, and disregarding overlap[1] of the various tree, shrub, and/or herbaceous layers and species.

% COVER BY LAYER

% Conifer Tree /Hardwood Tree: The total foliar cover (considering porosity) of all live tree species, disregarding overlap[1] of individual trees. Estimate conifer and hardwood covers separately.
Please note: These cover values should not include the coverage of regenerating tree species (i.e., tree seedlings and saplings).

% Regenerating Tree: The total foliar cover of seedlings and saplings, disregarding overlap[1] of individual recruits. See seedling and sapling definitions below.

% Shrub: The total foliar cover (considering porosity) of all live shrub species disregarding overlap[1] of individual shrubs.

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[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.

% Herbaceous: The total cover (considering porosity) of all herbaceous species, disregarding overlap[1] of individual herbs.

HEIGHT CLASS BY LAYER

Modal height for conifer tree /hardwood tree, shrub, and herbaceous categories: Record an average height value per each category by estimating the mean height for each group. Please use the following height intervals to record a height class: 01 = <1/2 m, 02 = 1/2-1 m, 03 = 1-2 m, 04 = 2-5 m, 05 = 5-10 m, 06 = 10-15 m, 07 = 15-20 m, 08 = 20-35 m, 09 = 35-50 m, 10 => 50 m. Note: *For the herbaceous layer height, this height class is based on the average plant height at the time of observation, as opposed to how this is recorded in the CWHR section (at maturity).*

SPECIES LIST AND COVERAGE

For rapid assessments, list up to 20 species that are dominant or that are characteristically consistent within the assessment area. These species may or may not be abundant, but they should be constant representatives in the survey. When different layers of vegetation occur, make sure to list species from each stratum. As a general guide, make sure to list at least 1-2 of the most abundant species per stratum. If constant, diagnostic, or interesting species occur outside the assessment area but in the stand, list the species and estimated stand cover in the Site History section.

For relevés, list all species present in the plot, using a second species list page if necessary.

Use the lower portion of the form to record unknowns, one species per line. This allows space for the final determination to be recorded without obscuring the original information.

For both sample types, provide the stratum:

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; resprouts 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.

Be consistent and don't break up a single species into two separate strata. The only time it would be appropriate to do so is when one or more tree species are regenerating, in which case the Seedling and/or Sapling strata should be recorded for that species. These may be noted on the same line, *e.g.:*

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

If you're unsure of the strata for a species, call it what it is called in the MCV or, as a second choice, the Jepson Manual.

C: If a species collection is made, it should be indicated in the collection column 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 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).

Use Jepson Manual nomenclature. Write out the genus and species of the plant. Do not abbreviate except for dominant species that do not have ambiguous codes. If you aren't sure there aren't duplicate codes, don't use a code. 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.

Provide the % absolute foliar cover for each species listed considering porosity. When estimating, it is often helpful to think of coverage in terms of the following cover intervals at first:

<1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%.

Keeping these classes in mind, refine your estimate to a specific percentage. All species percent covers may total over 100% because of overlap.

Include the percent cover of snags (standing dead) of trees and shrubs. Use the code "SNAG." Note their species, if known, in the "Species" column (i.e. SNAG – *Quercus wislizeni*).

For rapid assessments, make sure that the major non-native species occurring in the stand also are listed in the space provided in the species list with their strata and % cover.

For relevés, all non-native species should be included in the species list.

Also for relevés, record the <1% cover in one of two categories: "r" for trace (i.e., rare in plot, or solitary individuals) and "+" for <1% but not rare or solitary individuals.

Unusual species: List species that are locally or regionally rare, endangered, or atypical (*e.g.,* range extension or range limit) within the stand. This field will be useful to the Program for obtaining data on regionally or locally significant populations of plants.

GEOLOGY CODE

IGTU	**Igneous (type unknown)**
MIIG	Mixed igneous
ULTU	Ultramafic (type unknown)
VOLC	General volcanic extrusives
ANDE	Andesite
ASHT	Ash (of any origin)
BASA	Basalt
DIAB	Diabase
OBSI	Obsidian
PUMI	Pumice
PYFL	Pyroclastic flow
RHYO	Rhyolite
VOFL	Volcanic flow
VOMU	Volcanic mud
INTR	General igneous intrusives
DIOR	Diorite
GABB	Gabbro
GRAN	Granitic (generic)
MONZ	Monzonite
PERI	Peridotite
QUDI	Quartz diorite
METU	**Metamorphic (type unknown)**
MIME	Mixed metamorphic
GREE	Greenstone
BLUE	Blue schist
FRME	Franciscan melange
GNBG	Gneiss/biotite gneiss
HORN	Hornfels
MARB	Marble
PHYL	Phyllite
SCHI	Schist
SESC	Semi-schist
SLAT	Slate
ULTU	Ultramafic (type unknown)
SERP	Serpentine
SETU	**Sedimentary (type unknown)**
BREC	Breccia (non-volcanic)
CACO	Calcareous conglomerate
CALU	Calcareous (origin unknown)
CASA	Calcareous sandstone
CASH	Calcareous shale
CASI	Calcareous siltstone
CHER	Chert
CONG	Conglomerate
DOLO	Dolomite
FANG	Fanglomerate
LIME	Limestone
MISE	Mixed sedimentary
SAND	Sandstone
SHAL	Shale
SILT	Siltstone
CLAL	Clayey alluvium
DUNE	Sand dunes
GLTI	Glacial till, mixed origin, moraine
GRAL	Gravelly alluvium
LALA	Large landslide (unconsolidated)
LOSS	Loess
MIAL	Mixed alluvium
SAAL	Sandy alluvium
SIAL	Silty alluvium
MIRT	Mix of two or more rock types
OTHE	Other than on list

ROCK SIZE

Boulder	> 60 cm diameter
Stone	25 cm to 60 cm
Cobble	7.5 cm to 25 cm
Gravel	2 mm to 7.5 cm
Fines	< 2 mm

DISTURBANCE CODES

01 Development
02 ORV activity
03 Agriculture
04 Grazing
05 Competition from exotics
06 Logging
07 Insufficient population/stand size
08 Altered flood/tidal regime
09 Mining
10 Hybridization
11 Groundwater pumping
12 Dam/inundation
13 Other
14 Surface water diversion
15 Road/trail construction/maint.
16 Biocides
17 Pollution
18 Unknown
19 Vandalism/dumping/litter
20 Foot traffic/trampling
21 Improper burning regime
22 Over collecting/poaching
23 Erosion/runoff
24 Altered thermal regime
25 Landfill
26 Degrading water quality
27 Wood cutting
28 Military operations
29 Recreational use (non ORV)
30 Nest parasitism
31 Non-native predators
32 Rip-rap, bank protection
33 Channelization (human caused)
34 Feral pigs
35 Burros
36 Rills
37 Phytogenic mounding
38 Sudden Oak Deat

Combined Vegetation Rapid Assessment and Relevé Field Form

(Revised March 26, 2015 for Southern Sierra Nevada Foothills)

For Office Use:	Final database #:	Final vegetation type:	Alliance Association

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION circle: **Relevé or RA**

Database #: **Date:** **Name of recorder:**

Other surveyors:

Location Name:

GPS name: _____ For Relevé only: **Bearing°**, left axis at ID point____ **of Long / Short** side

UTME __ __ __ __ __ __ **UTMN** __ __ __ __ __ __ __ **Zone: 11 NAD83** GPS error: **ft./ m./ PDOP** ____

Decimal degrees: **LAT** __ __ . __ __ __ __ __ __ **LONG** __ __ __ . __ __ __ __ __ __

GPS within stand? Yes / No If No, cite from GPS to stand: distance (m) ____ bearing ° ____ inclination ° ____

and record projected UTMs: UTME __ __ __ __ __ __ UTMN __ __ __ __ __ __ __

Camera Name: **Cardinal photos at ID point:**

Other photos:

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

Exposure, Actual °: _____ NE NW SE SW Flat Variable | Steepness, Actual °: _____ 0° 1-5° 5-25° > 25

Topography: Macro: top upper mid lower bottom | Micro: convex flat concave undulating

Geology code: _____ Soil Texture code: _____ | Upland or **Wetland/Riparian** (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)

H_20: BA Stems: Litter: Bedrock: Boulder: Stone: Cobble: Gravel: Fines: =100%

% Current year bioturbation _____ Past bioturbation present? Yes / No | % Hoof punch _____

Fire evidence: Yes / No (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments:

Disturbance code / Intensity (L,M,H): ____/___ ____/___ ____/___ ____/___ ____/___ **"Other"** _____/___

II. HABITAT DESCRIPTION

Tree DBH : T1 (<1" dbh), **T2** (1-6" dbh), **T3** (6-11" dbh), **T4** (11-24" dbh), **T5** (>24" dbh), **T6** multi-layered (T3 or T4 layer under T5, >60% cover)

Shrub: S1 seedling (<3 yr. old), **S2** young (<1% dead), **S3** mature (1-25% dead), **S4** decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.), **H2** (>12" ht.)

III. INTERPRETATION OF STAND

Field-assessed vegetation Alliance name: _____

Field-assessed Association name (optional): _____

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

Confidence in Alliance identification: L M H Explain: _____

Phenology (E,P,L): Herb___ Shrub___ Tree___ Other identification or mapping information:

Combined Vegetation Rapid Assessment and Relevé Field Form

(Revised March 26, 2015 for Southern Sierra Nevada Foothills)

Database #: __________

SPECIES SHEET

IV. VEGETATION DESCRIPTION

% NonVasc cover:____ Total % Vasc Veg cover:_____ ☐

% Cover - **Conifer tree / Hardwood tree:** ____/____ **Regenerating Tree:** ____ **Shrub:** ____ **Herbaceous:** ____ ☐

Height Class - **Conifer tree / Hardwood tree:** ____/____ **Regenerating Tree:** ____ **Shrub:** ____ **Herbaceous:** ____ ☐

Height classes: 01=<1/2m 02=1/2-1m 03=1-2m 04=2-5m 05=5-10m 06=10-15m 07=15-20m 08=20-35m 09=35-50m 10=>50m

Stratum categories: T=Tree, S = Shrub, H= Herb, E = SEedling, A = SApling, N= Non-vascular

% Cover Intervals for reference: r = trace, + = <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%

Strata	Species	% cover	C	Strata	Species	% cover	C

Strata	Species	% cover	C	Final species determination

Unusual species: ____

DOH

7/9

Combined Vegetation Rapid Assessment and Relevé Field Form

(Revised March 26, 2015 for Southern Sierra Nevada Foothills)

For Office Use:	Final database #:	Final vegetation type:	Alliance Association

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION — circle: **Relevé or RA**

SSNF1421

Date: 6/9/15 — Name of recorder: AAW — Other surveyors: ——

Location Name: Sierra NF

GPS name: BAY — For Relevé only: **Bearing°**, left axis at ID point____ **of Long / Short** side

UTME ____ **UTMN** ____ **Zone: 11** **NAD83** GPS error: **ft./ m./ PDOP** ____

Decimal degrees: **LAT** 37.166667 **LONG** -119.482297

GPS within stand? (Yes) / No If No, cite from GPS to stand: distance (m) ____ bearing ° ____ inclination ° ____
and record projected UTMs: UTME ____ UTMN ____

Camera Name: BAY **Cardinal photos at ID point:** JC 441 - 444
Other photos:

Stand Size (acres): <1, (1-5), >5 | **Plot Size (m²):** 100 / ____ | **Plot Shape** ____ x ____ m | **RA Radius** 40 m

Exposure, Actual °: 16 (NE) NW SE SW Flat Variable | **Steepness, Actual °:** 23 0° 1-5° (5-25°) > 25

Topography: Macro: top upper (mid) lower bottom | Micro: (convex) flat concave undulating

Geology code: GRAN **Soil Texture code:** MESA | (Upland) or **Wetland/Riparian** (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)

H20: 0 **BA Stems:** | **Litter:** 5 **Bedrock:** 0 **Boulder:** 0 **Stone:** 0 **Cobble:** 0 **Gravel:** 1 **Fines:** 93 =100%

% Current year bioturbation 2 **Past bioturbation present?** (Yes) / No | **% Hoof punch** 0

Fire evidence: Yes / (No) (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments: Aesculus stand with about 2% Fraxinus dipetala on north-facing slope. Thin herb cover. Grass and Forb probably 50/50. Aesculus cover would be higher but is defoliating

Disturbance code / Intensity (L,M,H): 5 / L ___/___ ___/___ ___/___ ___/___ **"Other"** ____/___

II. HABITAT DESCRIPTION

Tree DBH : **T1** (<1" dbh), **T2** (1-6" dbh), (**T3**) (6-11" dbh), **T4** (11-24" dbh), **T5** (>24" dbh), **T6** multi-layered (T3 or T4 layer under T5, >60% cover)

Shrub: **S1** seedling (<3 yr. old), **S2** young (<1% dead), **S3** mature (1-25% dead), (**S4**) decadent (>25% dead)

Herbaceous: (**H1**) (<12" plant ht.), **H2** (>12" ht.)

III. INTERPRETATION OF STAND

Field-assessed vegetation Alliance name: Aesculus californica

Field-assessed Association name (optional): Fraxinus dipetala

Adjacent Alliances/direction: CECU / S / ____

Confidence in Alliance identification: L M (H) **Explain:** ____

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

QC-JC 8-27

Combined Vegetation Rapid Assessment and Relevé Field Form

(Revised March 26, 2015 for Southern Sierra Nevada Foothills)

Database #: SSNF1421 SPECIES SHEET

IV. VEGETATION DESCRIPTION

% NonVasc cover: 4 **Total % Vasc Veg cover:** 15

% Cover - **Conifer tree / Hardwood tree:** +/5 **Regenerating Tree:** + **Shrub:** 2 **Herbaceous:** 10

Height Class - Conifer tree / Hardwood tree: 5/5 **Regenerating Tree:** 4 **Shrub:** 4 **Herbaceous:** 1

Height classes: 01=<1/2m 02=1/2-1m 03=1-2m 04=2-5m 05=5-10m 06=10-15m 07=15-20m 08=20-35m 09=35-50m 10=>50m

Stratum categories: T=Tree, S = Shrub, H= Herb, E = SEedling, A = SApling, N= Non-vascular

% Cover Intervals for reference: r = trace, + = <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%

Strata	Species	% cover	C	Strata	Species	% cover	C
A	Pinus sabiniana	+					
T	Aesculus californica	3					
T	Quercus douglassii	+					
T	Fraxinus dipetala	2					
S	Ceanothus cuneatus	+					
S	Cercocarpus betuloides	+					
S	Toxicodendron diversilobum	1					
S	Lonicera interupta	+					
S	Actostaphylos viscida	+					
T/A	Quercus wislizeni	+/+					
H	Avena barbata	2					
|	Bromus diandrus	3					
|	Torilis arvensis	2					
|	Madia elegans	2					
|	Pentagramma triangularis	+					
|	Poa secunda	+					
|	Collinsia heterophyla	+					
V	Triteleia laxa	+					
N	Moss	4					
H	Leptosiphon bicolor	+					
	✓ 21 entries						

Strata	Species	% cover	C	Final species determination

Unusual species: _____

Appendix 2. Key to field crew's initials used on field sheets and in database, organized alphabetically by the initials used.

Staff Name	Initials Used
Aaron Wentzel	AAW
Catherine Curley	CHC
Daniel Hastings	DOH
Jennifer Buck-Diaz	JJB
Julie Evens	JME
Jake Schweitzer	JS
Jaime Ratchford	JSR
Joslyn Curtis	JTC
John Vollmar	JV
Pam DeVries	PDV
Melinda Elster	MLE
Roisin Murphy-Deak	RAD
Sara Taylor	SMT
Vanessa Stevens	VS

Appendix 3. Example permission form used to gain written permission to sample on private lands. All signed permission letters were transferred to VegCAMP and are on file there.

CALIFORNIA
NATIVE PLANT SOCIETY

February 23, 2016

Dear landowner,

Thank you for your time and attention to this letter. The California Native Plant Society (CNPS), in partnership with Vollmar Natural Lands Consulting (VNLC), is undertaking a project to survey and map vegetation throughout the Southern Sierra Foothills region. The study area extends from Mariposa to Kern County along the lower Sierra Nevada foothills from roughly 500-2,500 feet in elevation. The project follows other vegetation mapping projects that we have conducted in other regions of the state. The purpose of the project is to produce a vegetation map that will be used for multiple, broad purposes such as regional fire and fuels management planning, game management and wildlife habitat identification, water conservation and management, and watershed assessments. We are doing the project under contract to the California Department of Fish & Wildlife (CDFW). We appreciate your support of this project by granting access to your property for the purpose of collecting vegetation plot data that will be used to develop the vegetation map.

The vegetation data collection on your property will be simple and will leave no permanent disturbances or markers. For each plot (roughly 100 feet in diameter), we will record the presence and cover of plant species, soil type, slope, aspect and other general features within the plot. We will also take representative photographs of the plot and map the location using a GPS unit. Any temporary flagging or other markers used during the sampling will be removed before we leave for the day. Small amounts of plants or plant parts may be collected for specific identification. Field work is planned for March through May of 2016. We are requesting your permission for two to four botanists to visit your property once or twice during this time period.

In terms of potential liabilities, all of our senior team members have extensive experience working on private lands and with private landowners on these types of projects. We are fully aware of landowner concerns related to fire hazards, leaving gates opened or closed as they are found, minimally disturbing livestock, and other potential issues. Please be assured that we will attend to these issues carefully during the course of our field work. Additionally, our permission form provides landowners with an indemnity agreement, and CNPS maintains general liability insurance with a limit of at least $1 million during the course of the project. Though all these measures, we believe the landowners are protected against potential liabilities from the project.

Please review the attached "Permission to Enter" form, complete it, and return it to the address below. Please feel free to contact me at (916) 322-2455 with any questions or concerns you may have regarding the form or the proposed Southern Sierra Nevada Foothills survey. You may also contact Diana Hickson, Senior Environmental Scientist, at CDFW at (916) 327-5956 or diana.hickson@wildlife.ca.gov.

Thank you in advance for your support,

Jaime Ratchford
Field Sampling Coordinator, California Native Plant Society

CALIFORNIA
NATIVE PLANT SOCIETY

Permission to Enter

Permission to survey and sample vegetation on the property, , in the County of , is hereby granted to the California Native Plant Society (CNPS), and their subcontractor Vollmar Natural Lands Consulting, subject to the following conditions:

1) The purpose of this agreement is to allow access to areas of vegetation to facilitate the state efforts to improve understanding of Southern Sierra Foothill vegetation.

2) CNPS and VNLC agree that permission to enter the property may be revoked at any time and that this agreement does not create an easement or right-of-way over the property.

3) CNPS and VNLC agree to hold landowner and/or lessee in possession harmless against all loss arising from the survey due to the actions of CNPS or VNLC staff members under this agreement.

4) The terms of this agreement do not affect existing riparian or appropriated water rights of the landowner or lessee in possession.

Now, made this day by and between the California Native Plant Society and the property owner/lessee in possession, this agreement will expire on or before June 30, 2016.

Landowner/Lessee in Possession

Signature:

_____

Print Name:

_____

California Native Plant Society

Signature:

_____

Print Name:

_____

CALIFORNIA
NATIVE PLANT SOCIETY

Please provide the information below.

Please let us know if you would like a report of our findings on your property.

YES NO
☐ ☐

Please indicate if you would like to be notified before we conduct vegetation sampling on your property.

YES NO
☐ ☐

Contact Phone Number: _____

Questions or Comments: