KLAMATH MOUNTAINS ECOREGION VEGETATION SAMPLING



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Photos on Cover:

Top Left: California Pitcher plant (*Darlingtonia californica*) Fen Association on the edge of an alpine lake in the foreground, and Red Fir – Lodgepole Pine (*Abies magnifica – Pinus contorta* ssp. *murrayana)* Association in the background at Picayune Lake (Shasta County), (photo by Annie Allen).

Top Right: A mosaic of post-fire, forest and shrubland Alliances in Whiskeytown National Recreation Area, NPS (Shasta County), (photo by Samantha Swatling-Holcomb).

Bottom Left: Big Sagebrush (*Artemisia tridentata*) Alliance on the edge of East Boulder Lake in Klamath National Forest (Siskiyou County), (photo by Samantha Swatling-Holcomb).

Bottom Right: Foxtail Pine – Red Fir (*Pinus balfouriana – Abies magnifica*) Association on Packers Peak in Shasta-Trinity National Forest (Trinity County), (photo by Samantha Swatling-Holcomb).



Photo Above: Julie Evens (center) leading a discussion on vegetation types while training students from Cal Poly Humboldt along the bank of the Smith River in Del Norte County during the Veg-a-thon in May of 2024. (Photo by Nani Teves).

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ABSTRACT

The California Native Plant Society (CNPS), contracted by the California Department of Fish and Wildlife (CDFW), collected vegetation data within the Klamath Mountains Ecoregion (KLMO), which will be used to develop a hierarchical vegetation classification. CNPS and partners, at Bigfoot Trail Alliance and California State Polytechnic University, Humboldt, coordinated with landowners and land managers to obtain land access permits for vegetation sampling. Using the CNPS-CDFW Protocol for Combined Vegetation Rapid Assessment and Relevé Sampling, CNPS and partners collected over 1,770 surveys including 1,219 rapid assessment surveys, 547 relevé plots, and 4 reconnaissance surveys. We completed vegetation sampling across three field seasons between May 2023 and October 2025. The surveys and plots collected represent more than 219 field-assessed vegetation alliances. The vegetation survey and plot data were entered into the CDFW/CNPS joint Access database and have been thoroughly quality controlled by the CNPS staff.

ACKNOWLEDGEMENTS

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INTRODUCTION

ECOLOGICAL SETTING

The Klamath Mountains Ecoregion (Figure 1) is characterized by a diverse and complex landscape shaped by a unique combination of climatic, geological, and ecological factors. As a result, this region encompasses a variety of vegetation communities, ranging from dense coniferous forests to serpentine woodlands and montane chaparral (example, Figure 2), providing critical habitat for numerous plant and animal species. The rugged topography, coupled with variations in precipitation and temperature, supports a high level of plant endemism and biodiversity. Fire plays a crucial role in structuring species composition and structure of vegetation patterns. Rivers and wetlands further contribute to the richness of vegetation in the project area.

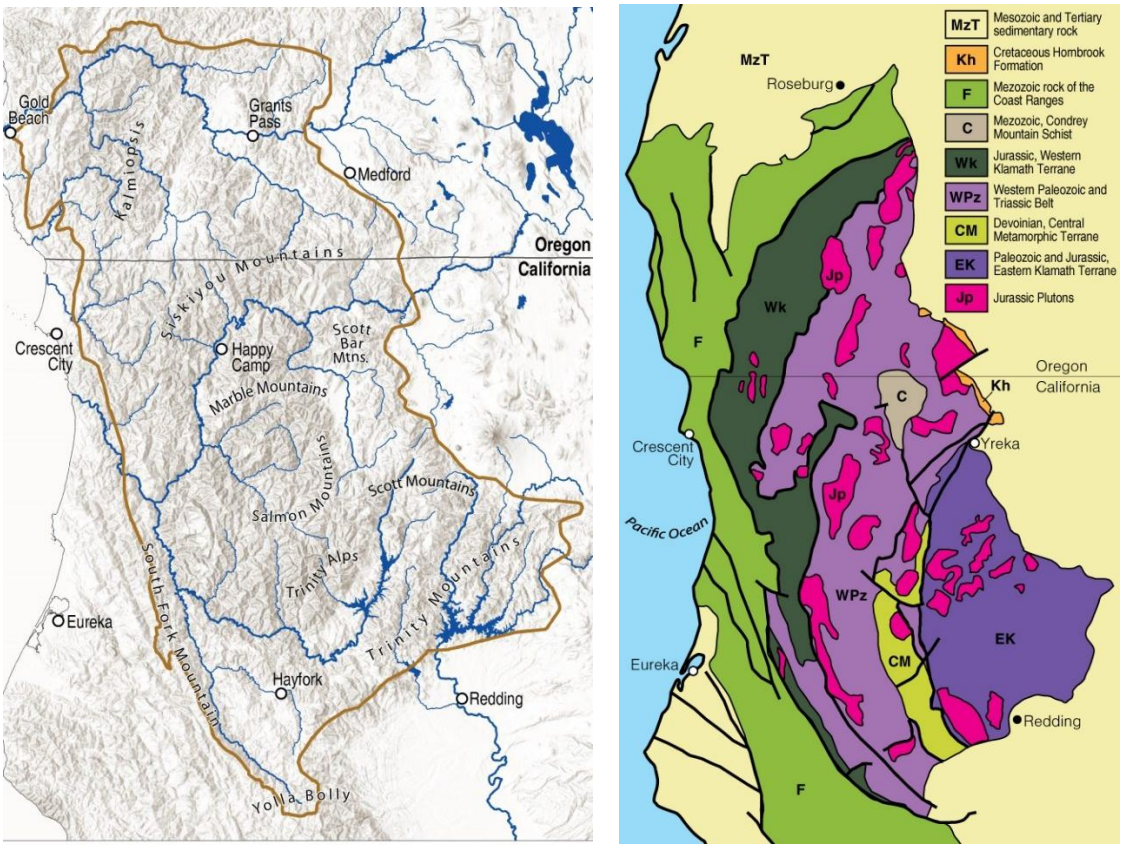


Figure 1. A map of the Klamath Mountains with its topography (left) and geologic units (right) from *The Klamath Mountains: A Natural History* (Kauffmann and Garwood 2022).



Figure 2. An example of the complex landscape and vegetation in the Klamath Mountains Ecoregion, above Gumboot Lake in Shasta-Trinity National Forest, (photo Julie Evens).

PROJECT & SAMPLING OVERVIEW

The California Native Plant Society (CNPS) was contracted by the California Department of Fish and Wildlife (CDFW) to representatively sample vegetation across the Klamath Mountains Ecoregion. The project area was defined by the boundaries of the USDA Klamath Mountains Ecoregion, which is approximately 5.5 million acres in area (USDA Forest Service, 1994) (Figure 3). CNPS, in collaboration with Cal Poly Humboldt (CPH) and Michael Kauffman developed a sampling strategy to collect a minimum of 1,600 vegetation surveys and 200 plant voucher specimens between 2023 to 2025 within the project area, following established CDFW-CNPS Rapid Assessment and Relevé vegetation protocols (Appendix A). These surveys included rapid assessments in shrublands, woodlands, and forests, as well as relevé plots in herbaceous stands including wetlands and grasslands. Data collection was guided by a randomized sample allocation provided by CDFW to ensure spatial representation across the study area, targeted survey allocation based on expert knowledge of unique and/or underrepresented vegetation types, and opportunistic sampling of underrepresented vegetation types by field crews during the field sampling effort. Field crews documented plant composition, structure, and site characteristics, and utilized GIS-based tools to track progress in near real-time. In addition, CNPS and CDFW compiled existing vegetation plot data in the project area. Both the compiled and collected data will contribute to an updated floristic classification, supporting long-term conservation and land management efforts in the Klamath Mountains.

METHODS

FIELD SAMPLING

Sample Allocation

Prior to field sampling, CDFW used a stratified random survey design in ArcGIS Pro to generate a target sample point allocation to guide vegetation survey locations for this project. The allocation approach attempted to balance three goals: 1) generate a target number of samples based on predicted field survey staff capacity (time and budget); 2) distribute sampling among the coarse vegetation types so that both rare and common types are represented; and, 3) facilitate access to sites based on land ownership and proximity to roads or trails.

The stratified random survey design used the CalVeg North Coast East vegetation dataset (USDA Forest Service, 2002-2010), and the National Wetlands Inventory (NWI, USFWS 2016) dataset to stratify the allocation of sample target points. These two datasets were combined using an identity procedure, and then divided by areas below and above 1500 m elevation as a proxy for the average snowline, and further divided by areas of ultramafic soil selected from Soil Survey Geographic Database (USDA NRCS 2023). Then the region was divided by fire perimeters (CalFire 2021) for years 2017–21. Areas of high soil burn severity as determined by Burned Area Emergency Response (BAER 2021) data were excluded. Exclusions were also made for recent clearcuts as identified in Timber Harvest Plan data (CalFire 2022). The allocation area was bounded within 500 m of roads that occurred within parcels found in the California Protected Areas Database (GreenInfo Network 2022), as well as private lands identified as potential locations should a permit to sample be obtained. Stratification was based on unique cover type combinations between CalVeg, NWI, elevation, ultramafic, and fire layers across the study area. A stratification of the unique combinations was done, and then the Create Random Points tool in ArcMap was used to generate target points according to the stratification and desired total. The final stratified random allocation contained 377 points.

In addition to the random allocation, visual allocation of sample points was done through manual photo interpretation of vegetation patterns and expert knowledge of unique, culturally important, or under-sampled vegetation by CNPS field coordinators (Tommy Van Eyk, Julie Evens) and partners such as Michael Kauffmann with the Bigfoot Trail Alliance, Todd Keeler-Wolf with CDFW, and CNPS chapter members (including Dana York and Julie Kierstead). Specific vegetation types needing further representation in classification surveys were summarized and agency partners helped identify target locations. Visual allocation points were also informed by CDFW-provided information on sensitive and rare plant species locations of priority for documenting in the field surveys. Approximately 820 visual targets were created.

This stratified random sample allocation, in combination with manual photo-interpreted sample allocation and opportunistic identification of stands through reconnaissance, enabled more samples to be collected while also increasing the diversity of vegetation types sampled.

CDFW and CNPS drafted a preliminary list of alliances and associations based on the state classification of A Manual of California Vegetation (MCV), with many agency partners assisting in refining this preliminary list. The list included survey number goals for each alliance based on existing knowledge and the number of associations expected within each alliance. Field crews carried this list of MCV vegetation alliances and associations that potentially occur within the study area, with target survey counts for each, and kept a running tally of the number of surveys already collected for each type. This ensured that sampling was distributed proportionally across the known types and that as many types as could be discovered were sampled. Sampling goals for each alliance were revised over the course of the project and were used to guide priorities when sampling.

Land Access

To facilitate field data collection for classification surveys, CNPS employed a systematic approach to secure land access across the sampling area (Figure 3). An analysis of the project boundaries and stratified-random sampling allocation allowed us to identify and prioritize outreach to landowners and land managers of large holdings and/or with a high density of sensitive natural communities.

Project descriptions and summaries were sent to public land managers including the U.S. Forest Service (USFS), the California Department of Parks and Recreation (CDPR), the Bureau of Land Management (BLM), and municipal entities, as well as private landowners including timber companies and land trusts. Agreements permitting access were tailored to secure the necessary permits, liability waivers and certificates of insurance to cover CNPS staff and subcontractors while accessing lands.

CDFW and CNPS obtained regional and statewide permits from project partners and land managers, including for public land managed by the CDPR, USFS, BLM, and the National Parks Service (NPS). A comprehensive spreadsheet was created to track landowner names, contact information, and permitting details.

A “Location” field for the vegetation survey data was used to standardize location names and ensure clear visibility of permit status for every survey, enabling efficient review by CDFW and other partners.

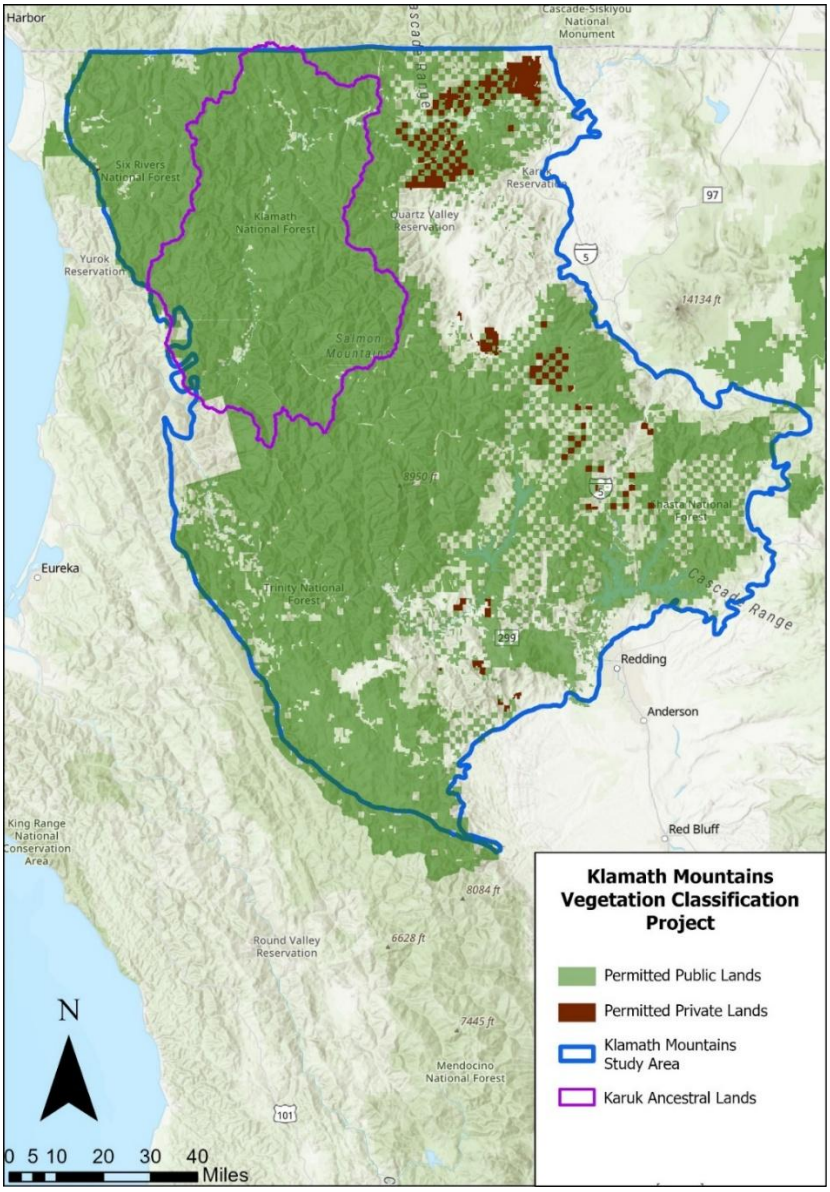


Figure 3. Study area map of the Klamath Mountains Ecoregion with public and private lands where vegetation field surveys were conducted with access agreements. Dark green areas are public lands with permits, and brown areas are private lands with permissions.

Data Collection

Sampling periods were in the spring, summer, and fall of 2023 through 2025. Surveys were performed by CNPS, Bigfoot Traill Alliance, and CPH field staff members, as well as CNPS volunteers, including members of the North Coast and Shasta chapters. The sampling team included two field leads from CNPS and three to four graduate and undergraduate students from CPH per field season, with support from a CNPS field

coordinators (Tommy Van Eyk, Kendra Sikes) and a Bigfoot Trail Alliance coordinator (Michael Kauffmann). Michael was instrumental in identifying areas with a diversity of vegetation across the region. He also scheduled at least two pack trips per year (with local packers who use horses/mules), for accessing remote reaches of wilderness areas with base camps set up, enabling field crews to make forays across the rugged landscape on and off trails.

Between 2023–2026, three graduate students at CPH from this project formulated research projects to collect data for master's theses, including Annie Allen, Courtney Copper, and Sebastian Evans. Two of these students (Courtney and Sebastian) worked to defend their theses before the end of the project. In 2024, CPH entered into a second contract with CDFW, which enabled them to hire more graduate students to do additional sampling within the project area (referred to herein as the KME project), focusing initially on the Russian Wilderness and then broadening to include other areas of interest with data lacking across the region (e.g., montane to subalpine conifers). Their contract also enabled more plant vouchers to be collected and processed.

At the beginning of each field season in mid-May, CDFW and CNPS staff assisted in training and calibrating the field crews on a) how to select vegetation stands to sample (using the sample allocations as a guide and training crews on how to assess the landscape patterns) and b) how to implement the CNPS–CDFW field sampling protocols. Rock Creek Ranch and Picayune Lake Preserve were two areas utilized that accommodated large groups at the beginning and end of the field season, respectively.

The target sample allocation points were used to direct exploration at the points and surrounding areas for homogeneous stands of vegetation to sample, rather than acting as fixed sampling locations. More than one vegetation type could be sampled in the area surrounding the target sample point if the sampling locations were greater than 500 m apart to control for autocorrelation, or if the vegetation stands were in different strata or in disparate hydrologic settings. Field crews assessed on-the-ground conditions for desired, unique, or under-sampled vegetation types throughout travel to sample allocation points for additional sampling locations. Field crews carried the list of MCV vegetation alliances and associations that potentially occur within the study area, with target survey counts for each, and kept a running tally of the number of surveys already collected for each type. See Appendix A for additional factors in determining stand selection for sampling.

Once a stand was selected for sampling, the CNPS–CDFW Combined Vegetation Rapid Assessment and Relevé protocol was used (Appendix A). Either a relevé plot or rapid assessment survey was done at each field sampling location. Protocols comply with state and national standards as defined by the Survey of California Vegetation (SCV; VegCAMP 2022) and the US National Vegetation Classification (USNVC 2025).

These protocols direct sampling within stands, defined as the basic physical unit of vegetation in a landscape, with a stand having both compositional and structural integrity of plant species. Compositional integrity is defined as similarity in species composition and relative cover; structural integrity refers to general regularity in the horizontal and vertical spacing of plant species as a result of topography, soils, geology, climate, slope, exposure, and site or disturbance history. A stand has no set size and may represent patterns as small as zones within a vernal pool, or quite expansive patches, such as a Douglas fir forest occupying several hundred acres.

The survey data included the date of sampling, GPS location, environmental characteristics of the sampled stands, plant species abundance, vegetation structure information, site history, and a field-assessed vegetation type. Additionally, four digital photos were taken in the cardinal directions at each GPS point, using digital cameras with a minimum of 8-megapixel resolution. Complete species lists were recorded for plot-based relevé surveys, while dominant and characteristic species were noted for stand-based Rapid Assessment (RA) surveys. Percent cover estimates were also recorded for all species listed in the survey. All species-level data were documented on paper field forms. Spatial information and environmental setting data were captured on GPS-enabled devices, as detailed in the digital data entry method section below.

Voucher plant specimens were collected at survey sites concurrent with vegetation sampling. CDFW provided a list of priority species for vouchering based on existing California Consortium of Herbarium records for the ecoregion. This list was used to guide surveyors' collection efforts in the field. Criteria for collections varied but was driven by appropriate phenology for vouchering and representation of the flora of under-collected locations. Voucher collections often represented the dominant or characteristic species at survey sites. Unknown plants within a survey were also collected for later identification and vouchering. The wrap-up of plant identification and processing of the vouchers was done at the Cal Poly Humboldt Vascular Plant Herbarium. In the fall/winter after each field season, plant keying sessions were scheduled by CPH students along with local botanist Dana York. A voucher collection label format was selected in consultation with the Herbarium curator, Robin Bencie, who coordinated with students on processing vouchers.

Digital Field Applications

Fieldwork utilized two main ESRI applications: ArcGIS Field Maps and Survey123. The Field Maps application was utilized for navigating to specific sample allocation points. Field Maps provided offline access to published ArcGIS Online (AGOL) maps, which

included satellite imagery layers crucial for evaluating stand size, type, and location, as well as property boundaries, vital for determining whether the stand was on a permitted property for sampling. At each field sampling location, surveyors utilized Field Maps to record the GPS location of the survey. Field crews synced data daily to a hosted ArcGIS Online (AGOL) map and feature class that allowed for near real time tracking of sample locations across multiple crews and allowed for efficient adaptation of field planning efforts.

The Survey123 application was used for detailed data entry in the field, incorporating custom forms for different survey types of rapid assessment, relevé, or reconnaissance. This application enabled the collection of GPS coordinates of the sample location, plot information, survey photos, species data, and environmental conditions. Survey123 also enabled us to embed figures and descriptions of field protocols within the form, allowing quick access to protocol resources such as the key to soil texture. The data collected on Survey123 was then synced and transferred to the AGOL geodatabase feature class, enhancing overall quality control (QC) procedures. This synchronization allowed for comprehensive access and comparison of field data across different sites, ensuring standardized and reliable recording. The combined use of Survey123 and Field Maps applications facilitated a robust and efficient digital data collection process. We utilized the Survey123 desktop application in the office to digitally enter plant composition and cover data that was recorded on paper datasheets in the field. Species names were entered in the survey database as they were recorded in the field. While the PLANTS Database (USDA NRCS 2025) was used as the source for plant codes, the Jepson eFlora (Jepson eFlora Project 2025) was the primary source for current nomenclature and plant identification. Taxa that could not be found in the PLANTS Database were assigned custom codes based on the Jepson eFlora.

Additionally, CNPS staff and partners created ArcGIS Dashboards and scripts to streamline display, tracking, and overall QC of the field data. Tukman Geospatial created a tracking dashboard that summarized names and counts for the field-assessed alliance and association types, in which a table was exported bimonthly to track progress and to direct sampling. CNPS created other dashboards linked with Survey123 editing forms, with a map showing the survey locations, sub-forms displaying specific components of the survey records, and summary tables for streamlining data review and QC. Queries and scripts were utilized to verify and standardize data entries, such as survey IDs, GPS coordinates, and species details. At the conclusion of our project, the field data was compiled into a standalone Access database for additional quality control before submission for CDFW review. This meticulous approach to database

management enabled us to refine our dataset, ensuring required accuracy across the data entry of our surveys.

RESULTS

SAMPLING

Land Access

CNPS had or gained access to approximately 72% of the study area, with land access permissions secured. Of that approximately 4 million acres, most were public lands, with about 2.6% being private lands (see Figure 3). Based on this land access, we drafted annual sampling plans denoting priority locations and vegetation types, and we created a sampling calendar by sampling week in Excel. Some landowners requested reports of data collected, in which CNPS staff generated simple summary reports that included plant composition, field-assessed alliances, and geographic locations for surveys.

Data Collection

CNPS staff, volunteers, and subcontractors collected a total of 1,766 classification surveys in the Klamath Mountains (KLMO) project between May and October each year for three years from 2023 to 2025, including 1,219 rapid assessment (RA), 547 relevé, and an additional 4 reconnaissance surveys. Thirty-one surveys were collected outside of the Klamath Mountains Ecoregion, with prior approval by CDFW to expand the collection area (Figure 5). Concurrently, the CPH-led KME project collected a total of 588 classification surveys between May 2024 and September 2025. CNPS-led field sampling documented approximately 479 and 219 field assessed associations and alliances respectively. Alliances and associations were field assessed, so the final number of alliances and associations sampled will be determined after classification analysis. Based on the original target allocation, the numbers of surveys with tentative alliance assignments are provided in Appendix B. Approximately 210 surveys were not given a field alliance and/or association at the time because the field surveyors could not easily determine an alliance type within the MCV classification to adequately describe the vegetation community.

In addition to collecting samples, we received scans of survey data from the National Park Service that was collected in 2002 from Whiskeytown National Recreation Area, which required data entry. CNPS staff and volunteers have been entering the legacy data, with 364 (of approximately 600) vegetation surveys entered to date.

All new and compiled data are stored within a geodatabase and a standardized Access database. Data will be publicly available on CDFW's Biogeographic Information and Observation System upon project completion (BIOS; https://apps.wildlife.ca.gov/bios6/).

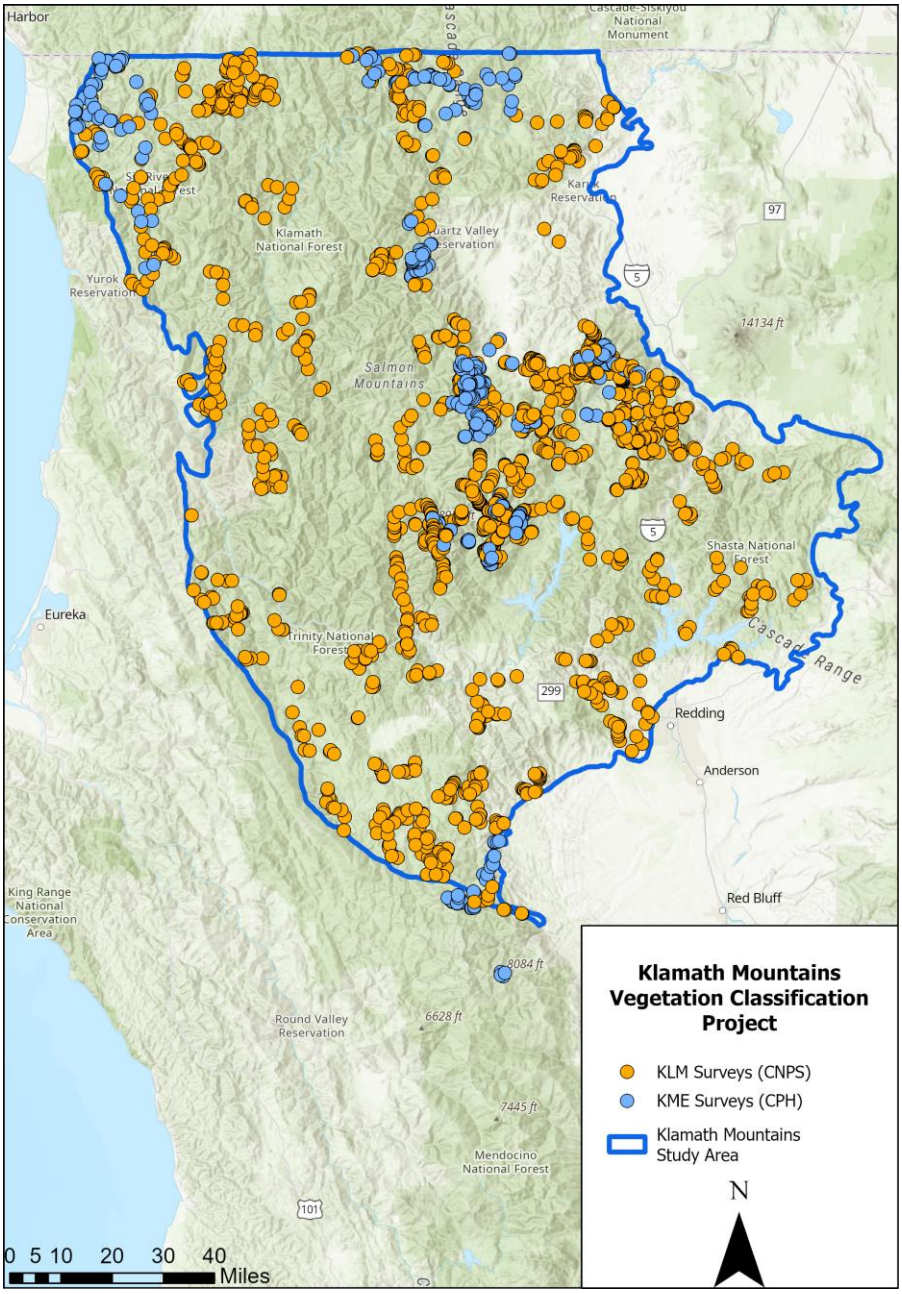


Figure 4. Locations of vegetation classification survey points in the Klamath Mountains Ecoregion. Orange points are surveys collected in 2023–2025 by CNPS, CPH, and BFTA. The blue points are surveys collected in 2024–2025 by the CPH-led project.

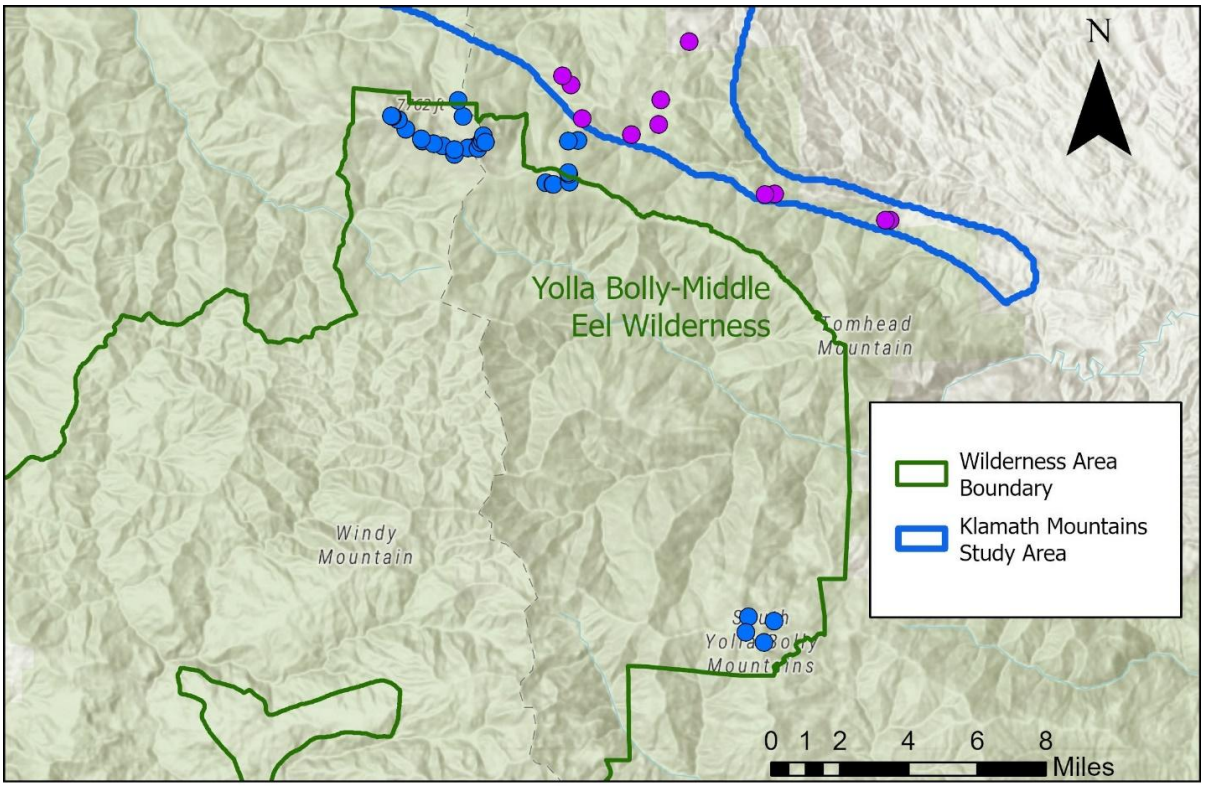


Figure 5. Surveys collected outside of the Klamath Mountain ecoregion boundary (blue points) in the Yolla Bolly Wilderness, and surveys within the southeast edge of the ecoregion (purple points).

Across the KLMO surveys, about 1600 plants were observed during CNPS-led sampling in the Klamath Mountains study area between 2023 – 2025 (See Appendix C). By the end of the 2025 field season, 558 plant specimens representing 365 taxa from 56 plant families were collected on CNPS-led surveys by CNPS and partners during the classification sampling for the Klamath Mountains (see Appendix D). These collections were contributed by 21 different collectors under permits from a variety of public and private landowners. Most of the collections were submitted to the Cal Poly Humboldt Vascular Plant Herbarium for curation and future study. Twenty-three of the 558 plant specimens were deposited at CHSC (Chico State Herbarium). Notable collections include documentation of 29 California Rare Plant Ranked taxa, and multiple examples of range extensions (see Table 1). One collection documents a new population of *Eriastrum tracyi,* a listed California State Rare species. These specimens contribute valuable data to the understanding and preservation of the region's botanical diversity.

DISCUSSION

SAMPLING

Community Engagement

During this project, CNPS along with Michael Kauffman engaged with the public in a variety of ways. For example, we provided field-based trainings and sampling events (called Veg-a-thons) associated with the North Coast and Shasta chapters and regional botanists along with the field sampling crews. We held two trainings and Veg-a-thon forays each year, one at the beginning of the field season (in mid to late May) and one at the end of the field season (in early August), which included approximately 100 people from 2023 to 2025. Field sites were selected to enable between four to seven sampling groups to split up and sample a variety of vegetation patterns across various roads and trails. Environmental groups and landowners were instrumental in providing locations to host larger groups, including the Smith River Alliance (at Rock Creek Ranch), Hank Magnuski (at Picayune Lake Preserve), and Scott River Watershed Council (at Sugar Creek Ranch). This also enabled us to cross-train with other agencies such as the US Forest Service and the Natural Resources Conservation Service. Additionally, Michael Kauffmann gave a CNPS North Coast chapter talk providing an overview about the project, CNPS and CNPS presented a lightning talk at the January 2025 Northern California Botanists symposium, and CPH graduate students presented their research at the February 2026 CNPS conference.

Potential for Floristic Range Extensions

Extensive floristic-based vegetation sampling of the ecoregion resulted in observations and voucher collections of previously undocumented or under-documented species. At least 9 of these have been collected, verified, and deposited, and the additional 10 species listed below were identified in the field but were not collected (Table 1). These species are not listed as occurring in the Klamath Mountains Ecoregion in The Jepson Manual, but other databases including CalFlora, iNaturalist, and CCH2 contain records and observations of these species in nearby locations. These observations provide supporting evidence for potential species range extensions into the Klamath Mountains Ecoregion. Some are small range extensions that occur along the existing Jepson Ecoregion boundaries while others are likely disjunct populations. All of these observations require more extensive study and documentation to determine the validity of range extensions. However, these notable species observations underline the importance of thorough floristic documentation in under-studied ecoregions.



Figure 6. Upper left: May 2023 Sampling training with CPH students and CNPS staff in Six Rivers National Forest, east fork of Willow Creek, (photo Sara Bandali).

Figure 7. Upper right: May 2024 Sampling training with CPH students and CDFW staff in Six Rivers National Forest, Craigs Creek Trail, (photo Nani Teves).

Figure 8. Middle left: August 2023 Veg-a-thon at Picayune Lake Preserve, (photo Julie Evens).

Figure 9. Middle right: August 2024 Veg-a-thon at Rock Creek Ranch, (photo J. Evens).

Figure 10. Lower left & right. August 2025 Veg-a-thon participants (photos Silke Gathmann).

Table 1. List of plant species that represent range extensions, documented while sampling within the Klamath Mountains Study Area.

Species	Documentation Type	Significance
Calamagrostis purpurascens	voucher	range extension
Calycadenia micrantha	observation	potential range extension
Carex breweri	voucher	range extension
Carex harfordii	voucher	range extension
Descurainia incisa	observation	potential range extension
Diplacus mephiticus	voucher	range extension
Eriastrum tracyi	voucher	fills range gap for state listed species
Erigeron pumilus ssp. *intermedius*	voucher	range extension
Eriogonum dasyanthemum	observation	potential range extension
Eriogonum sphaerocephalum	observation	potential range extension
Erythranthe tilingii	observation	potential range extension
Fremontodendron californicum	observation	potential range extension
Hydrocotyle verticillata	voucher	range extension
Lomatium dasycarpum	observation	potential range extension
Lupinus lepidus var. *sellulus*	observation	potential range extension
Oxypolis occidentalis	observation	potential range extension
Salix breweri	voucher	range extension
Salix delnortensis	voucher	Upper elevation range extension
Stipa nelsonii var. *dorei*	observation	potential range extension

Extension of the Project Area: Yolla Bolly–Middle Eel Wilderness

During the course of this project, we extended sampling beyond the formal Klamath Mountains Ecoregion boundary into the North Coast Range, specifically within the Yolla Bolly–Middle Eel Wilderness (See Figure 5). This expansion was undertaken to address spatial gaps resulting from limited access during earlier surveying for the North Coast and North Coast Ranges Ecoregions following the 2020 August Complex Fire. The Yolla Bollys represent a biogeographically important transition zone linking the Klamath Mountains to the Coast Ranges and contain high-elevation flora that complements and contextualizes patterns observed across the Klamath region.

Of particular importance are the southern range extensions of several forest types more commonly associated with the Klamath Mountains and southern Cascades, including stands of *Pinus balfouriana* ssp. *balfouriana* and *Pinus monticola*. These high-elevation conifer communities provide insight into regional vegetation gradients, climatic tolerances, and floristic continuity across ecoregional boundaries. Including this area strengthens the broader classification effort by capturing ecological variability at the margins of the Klamath system and documenting vegetation types that may otherwise appear geographically truncated in the dataset.

Survey Limitations and Remaining Gaps

The Klamath Mountains Ecoregion encompasses an area roughly comparable in size to Vermont or New Hampshire, with deeply dissected terrain, limited road access in wilderness area designations, diverse geologic substrates and disturbance histories, and strong climatic gradients from coast to interior and from lowlands to subalpine summits. Despite three field seasons of intensive sampling, the vastness and complexity of the region made it challenging to comprehensively access all areas within the ecoregion.

Access limitations were particularly notable in portions of the mid-Klamath, including the eastern Siskiyou Mountains and western Marble Mountains, where lands occur within the Karuk Ancestral Territories (KAT) (Figure 3). While 106 surveys were collected in KAT during 2023, further communication with the Karuk Tribe resulted in forgoing further sampling within that area, which is approximately one quarter of the Klamath Ecoregion. Respect for Tribal sovereignty and land access constraints necessarily limited survey coverage in this area. As a result, several alliance targets were under-sampled or remain unmet.

In some cases, alliances that were originally targeted proved uncommon (*Abies grandis*, *Quercus lobata* Riparian) or may not occur within the Klamath Mountains Ecoregion (e.g., *Acer negundo*, *Pinus contorta* ssp. *contorta*, *Quercus lobata, Tamarix* spp.). Other alliances were partially addressed by the Cal Poly Humboldt-led KME surveys, but more than 20 alliances would still benefit from additional sampling to achieve robust representation. These include, but are not limited to the following field-assessed alliances:

Forest & Woodland Types:

- *Abies amabilis*
- *Abies concolor – Pinus lambertiana*
- *Abies lasiocarpa*
- *Aesculus californica*
- *Alnus rubra*
- *Arbutus menziesii*
- *Callitropsis nootkatensis*

Notholithocarpus densiflorus
Picea engelmannii

Shrubland Types:
Abies lasiocarpa - Populus tremuloides / Acer glabrum [proposed}
Dasiphora fruticosa (wetland vs. upland alliances)
Juniperus communis – Paxistima myrsinites
Prunus virginiana
Quercus berberidifolia
Quercus wislizeni – Quercus chrysolepis (shrub form)
Vaccinium uliginosum

Herbaceous & Sparsely Vegetated Types: (more than what are listed)
Achnatherum lemmonii - Racomitrium ericoides [proposed]
Agastache urticifolia – Geranium viscosissimum – Pteridium aquilinum
Carex limosa – Carex simulata – Eleocharis quinqueflora
Polygonum davisiae – Eriogonum marifolium – Arenaria pumicola

For some of these alliances, limited time and difficult access constrained sampling opportunities. In other cases, their naturally patchy distribution or narrow environmental requirements reduced encounter rates under the randomized allocation framework. In addition, the ability to augment sampling using the visual allocation process was limited by lack of information on existing locations.

Future work would benefit from targeted sampling in underrepresented areas, collaborative coordination with Tribal partners to explore opportunities for culturally appropriate access and shared knowledge, and continued attention to high-elevation and riparian systems that may be especially sensitive to climatic change.

CLASSIFICATION

Potential New Alliances or Associations

The original goal for this vegetation sampling project was 1,600 surveys, including 320 relevé (plot-based) surveys, yet we exceeded the survey count by more than 150 surveys and over 540 were relevé surveys. Over 120 vegetation stands did not fit well with descriptions and membership rules of vegetation alliances currently in the MCV. Surveyors provided a field-assessed alliance name of “Other” plus a preliminary alliance name or a “[proposed]” name.

At least 10 field-assessed alliances are not in the MCV, noted mostly as herbaceous types. See Appendix E for photos of some of these novel vegetation types (e.g., stands with *Anemone drummondii, Angelica tomentosa, Carex hoodii, Elymus trachycaulus, Eriogonum siskiyouense, Hastingsia alba, H. serpenticola, Ivesia gordonii, Ligusticum* spp., *Lomatium* spp., *Phlox diffusa, Rudbeckia* spp., *Veratrum viride,* etc.). Upon

general review of the survey data, we expect new alliances will be added to the MCV. These include alliances described in the U.S. National Vegetation Classification that relate to the project data, such as *Achnatherum lemmonii - Racomitrium ericoides* Rock Vegetation, *Festuca viridula - Carex hoodii - Lupinus* spp. Mesic Meadow, *Ligusticum* spp. - *Lupinus* spp. - *Delphinium* spp. Mesic Meadow, *Minuartia obtusiloba - Paronychia pulvinata - Silene acaulis* Alpine, *Phleum alpinum - Elymus trachycaulus - Agrostis variabilis* Mesic Meadow, *Polygonum davisiae - Eriogonum marifolium - Arenaria pumicola* Pumice, *Phlox* spp. - *Lomatium* spp. - *Carex* spp. Talus & Scree, and *Valeriana sitchensis - Luzula glabrata* var*. hitchcockii - Xerophyllum tenax* Mesic Meadow Alliances. Future classification analysis will provide clarity on these preliminary determinations. *Polygonum davisiae – Eriogonum marifolium – Arenaria pumicola* Alliance has been newly added to the MCV based, in part, on data collected in this project.

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APPENDIX A: CDFW-CNPS PROTOCOL FOR THE COMBINED VEGETATION RAPID ASSESSMENT AND RELEVÉ FIELD FORM

(January 11, 2024)

INTRODUCTION

This protocol describes the methodology for both the Relevé and Rapid Assessment (RA) vegetation sampling techniques as recorded in the Combined Vegetation Rapid Assessment and Relevé Field Form. The same environmental data are collected for both techniques. However, the relevé is a plot demarcated with a measuring tape, and all species within the plot are recorded along with cover values. The rapid assessment sample is not based on a taped plot, but 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.

In general, collect rapid assessments in woody vegetation and relevés in herbaceous vegetation. When working in an area that has not been sampled before, RAs in woody vegetation may list more than 20 species.

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 a forest type.

A stand is defined by three 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.
3) It is typically a repeating pattern on the landscape, in which the plant assemblage occurs in other sites with similar plant composition and environmental setting.

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).

Stands vary in size and may be sampled even if they are below a “minimum mapping unit” area (a mapping rule of set size such as 1 acre or 1/2 acre specific to a mapping project). For example, a vernal pool is often mapped at the group level because it is small in area, while

multiple vernal pool alliances or associations may exist and be sampled as separate stands within a broader map polygon.

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. A sample of vegetation is selected to be representative of the entire stand and should be conducted in a standardized way to ensure that it can be compared to samples of other stands. 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 RA 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 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 locate a sample area that captures the stand's common species composition and structural condition.

Tracking sampled vegetation types

For large projects, the number of samples should be tracked daily or weekly by field-assessed Alliance and Association type so that samples are distributed 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 and Associations 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 tracking.*

Selecting samples to avoid spatial autocorrelation

Do not place more than one sample within a stand. For large projects, separate sample locations to limit spatial autocorrelation. Try to spread samples representing the same vegetation type at least 500 to 1000 meters apart. When possible, do not sample adjacent stands, especially if the adjacent stand is within the same life form (tree, shrub, herb). For example, samples taken from different formations, subclasses, or classes (e.g., wetlands vs. uplands, lithomorphic vs. mesomorphic) adjacent to one-another have a lower probability of sharing species and may be sampled within 1000 meters of each other. However, avoid sampling adjacent stands that tend to have overlapping species even if they are technically different formations, such as a grassland adjacent to an open oak woodland. Flexibility may be necessary in the case of sensitive natural community types that may have limited sampling opportunities across the landscape or in cases where there are obvious ecological distinctions between adjacent stands and they share very little species overlap (e.g., distinct rings of a single vernal pool or variation within a single fen).

Plot Size

All relevés of the same type of vegetation need to be an equivalent size if they are to be analyzed together. Plot size is dependent on the type of vegetation under study. Therefore, general guidelines for plot sizes of tree, shrub, and herbaceous communities have been established. Sufficient work has been done in temperate vegetation to be confident the following conventions will capture a comprehensive list of species:

Herbaceous communities: 100 m^2 plot

Special herbaceous communities of small size, such as vernal pools, fens: 10 m^2 plot

Shrublands and riparian forest/woodlands: 400 m^2 plot

Open desert and other shrublands with widely dispersed but regularly occurring woody species: 1000 m^2 plot

Upland Forest and woodland communities: 1000 m^2 plot

Plot Shape

A relevé has no fixed shape, though plot shape should reflect the character of the stand and is either a square, rectangle, or circle. Adjust the orientation and dimensions of the plot to represent 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 sampling streamside riparian or other linear communities, the 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. Overarching plants do not need to be rooted within the plot to be included in the species list, however, 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 point will be considered the plot identifier (ID point) and should be in the SW corner of a rectangular or square plot, if possible, or in the center of a circular plot. If it is taken in another location, this should be noted in the Site History section.

Definitions of fields in the Field Form

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION

Relevé or RA: Circle the appropriate survey type.

Database #: This is the unique ID number for Relevés and Rapid Assessments, in the form of *PPPPxxxx*, where *PPPP* is the 4-character project code and *xxxx* is a unique 4-digit number (e.g. CARR0001 for Carrizo sample #1). If this is a long-term plot, a character from A to Z can be added to the unique ID for each re-sampling survey; so the first re-sample for CARR0001 would be CARR0001A.

Base Points: For a projected RA (GPS within stand = No), a Base Point will be taken where the surveyors are standing and a separate point will be projected into the stand. The ID of the basepoint is B_*PPPPxxxx*, i.e. B_CARR0001.

Photo Points: Occasionally, stand photos will be taken from a vantage point outside the stand, or in a place other than the survey point. The ID for this point is *PPPPxxxx*_P#, i.e. the first Photo Point for CARR0001 will be CARR0001_P1.

Date: Date of the sampling.

UID: The unique ID number of a reference point or allocation target that this survey describes (optional).

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

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

Location Name: The name of the property, location, park, or landowner name of permitted private properties. E.g. the specific name of the County Regional Park (XXXX), USFS (XXXXX), BLM property () or the owner name of a private parcel as it appears on your permit. Specific descriptions of where the stand and observer are within the stand belongs in the Site History field. Roadside/Right of Way surveys must include "Roadside" before the property name.

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 <u>Long / Short</u> side: Relevé only. For square or rectangular plots: from the ID Point, 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 ID 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 point is not within the stand (i.e., the point is projected or digitized in the field), these are the UTMs of the base point. Important: a projected point or a point digitized in the field must always have a base point associated with it (projected surveys with estimates of distance and bearing are preferred over digitization). A base point can serve as the base for several distance surveys.

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

Zone: Universal Transverse Mercator zone. Zone 10 is for California west of the 120th longitude; zone 11 is for California east of 120th longitude (the straight portion of California's eastern boundary).

NAD83: This is the default GPS datum. If you use a different one, cross this out and write in the correct datum.

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 direction to the center of 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 Base point ID: This is the ID of the base GPS point, where the surveyors were standing to record the distance survey. This is required for both projected points and points digitized in the field (gathering projection data is preferred).
and Projected UTMs: These are the coordinates of the projected point, 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. Note that a digitized point, e.g., using your finger to plunk the location that you are surveying in Collector, is NOT a projected point and is not recommended.

Camera Name: Write the camera name or code as identified by the users.

Cardinal photos at ID point: Take four photos in landscape orientation for each cardinal direction (N, E, S, W) starting clockwise towards the north, from the ID Point, and record the jpeg numbers here. This symbol can be used to indicate the cardinal photos: 

. Try to include the horizon line in each photo (if possible while getting a good representation of the vegetation). 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. A digital camera with a minimum 10 megapixel resolution is required.

Other photos: This may include cardinal photos at additional corners or other relevant photos. We recommend a diagonal photo facing NE from the SW corner when sampling an herbaceous relevé. 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 4,000 square meters (approximately 64 x 64 m), or 208 feet by 208 feet. One acre is similar in size to a football field.

Plot Area (m^2): Relevé only. Circle "100" for a 100m^2 plot or record the appropriate plot size.

Plot Dimensions: Relevé only. Record the length and width of the plot in meters.

RA Radius: Rapid Assessments only. Estimate the radius of the area of the stand viewable from your sample point. This value is separate from the Stand Size of vegetation being sampled and any additional details/constraints can be documented in the Site History.

The radius must fall completely within the stand boundary and therefore cannot be greater than the distance from the sample point to the edge of the stand in any direction. If you can see the entire stand, then the radius will be the distance from your GPS point to the closest edge of the stand. For example, the radius will be constrained in long linear stands to the minimum width of the stand and thus the RA radius may not capture the full area that you survey. 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. RA Radius informs mappers and the image analysts of the dimensions of the stand visible from the sample point, so they can make connections between the vegetation on the ground and information in imagery and other GIS datasets.

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 rather than measuring 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.

Steepness: (Enter Actual º and circle general category): Read degree slope from your clinometer or compass with built in clinometer by following the manufacturer's directions for use. Make sure to average the reading across the entire stand, even if you are sampling in a Relevé plot, since your plot is representative of the stand. If estimating rather than measuring, write "N/A" for the actual degrees, and circle the general category chosen.

Topography: First assess the broad (**Macro**) topographic feature or general position of the stand relative to the immediately surrounding landscape. This attribute does not refer to the watershed as a whole, but to a cross section of the topography at the location of your stand. For instance, if your stand is located along a small creek in a narrow, v-shaped canyon, your position would be at the "Bottom," even if the canyon itself slopes downward. Since stands can occupy more than just a single slope position, **circle all the positions that apply**.

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

Geology code: Geological parent material of stand. 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 plot (*e.g.,* coarse loamy sand, sandy clay loam). *See soil texture key for types.*

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

% Surface cover: The abiotic substrates of the plot. 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), including “basal area” of ground attachment, is not estimated in this section.

H_2O: Percent surface cover of running or standing water, ignoring the substrate below the water.

BA Stems: Percent surface cover of the basal area of vascular plant stems at the ground surface. For most vegetation types, BA is 1-3% cover.

Litter: Percent surface cover of litter, thatch, duff, or wood on the ground.

Bedrock: Percent surface cover of bedrock, including outcrops.

Boulder: Percent surface cover of rocks >60 cm in the longest dimension.

Stone: Percent surface cover of rocks >25–60 cm in the longest dimension.

Cobble: Percent surface cover of rocks >7.5–25 cm in the longest dimension.

Gravel: Percent surface cover of rocks 2 mm–7.5 cm in the longest dimension.

Fines: Percent surface cover of bare ground and fine sediment <2 mm in the longest dimension (*e.g.,* dirt, sand).

% Current year bioturbation: Estimate the percent of the plot 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 in the plot.

% Hoof punch: Note the percent of the plot surface that has been punched down by hooves (cattle or native grazers) in wet soil. Depressions must be >2 cm deep.

Fire Evidence: Circle Yes if there is visible evidence of fire within the stand, and note the type of evidence in the “Site history, stand age, 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. You may also record more general historic information if you lack the precise date of a fire (such as most recent fire appears to be 10-20 years ago).

Site history, stand age, comments: Briefly describe the stand including details about age/seral stage, disturbance history, nature and extent of land use, and other 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. Note any structural and phenological constraints to estimates of strata cover and height and any peculiarities of the site or observation that impact the vegetation measurements taken. Examples include: late phenology within deciduous tree stands reducing cover estimates or pygmy forests or other stunted growth. Include any additional details or constraints about the extent of the area assessed, meaning the area that has contributed to strata, height, and cover estimates. Also

include any important site information about the location of the stand or the observers, like adjacency to something visible on imagery or something like “point taken near the north boundary of the stand because of steep slope”.

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 a size/age/height class for the plot using the following tree, shrub, and/or herbaceous categories. These categories are based on functional life forms. This data links the structural components of sampled stands within the SCV classification to the CWHR classification.

Tree DBH: Circle one of the tree size classes provided when the tree canopy closure exceeds 10% 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, weighing the mean toward the larger tree dbh’s if large trees are consistent in the stand, though they may be low in cover. The “**T6 multi-layered**” dbh size class signifies 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. Stands in the T6 class must contain a total absolute tree cover that exceeds 60% including at least 10% cover of size class 5 (>24” dbh) trees growing over a distinct layer of trees in size classes 3 (>6-11” dbh) or 4 (>11-24” dbh) with at least 10% combined cover.

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

Herbaceous: Circle one of the herb height classes when herbaceous cover exceeds 2% 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.*

Desert Riparian Tree/Shrub: Circle one of the size classes by measuring mean stem height (whether tree and/or shrub stand).

Desert Palm/Joshua Tree: Circle one of the palm or Joshua tree size classes by averaging all the stem-base diameters (i.e., mean diameter of all stem-base sizes). Diameter is measured at the plant’s base above the bulge near the ground.

III. INTERPRETATION OF STAND

Field-assessed vegetation Alliance name: Enter the name of the Alliance following the Manual of California Vegetation (MCV) Online. Please use scientific nomenclature, *e.g.,*

Quercus agrifolia forest. Alliance and association names in the MCV follow the USDA Plants nomenclature in order to conform with the national standard. An Alliance is based on the dominant or diagnostic species of the stand, and usually reflects the uppermost and/or dominant height stratum. A dominant species tends to cover the greatest area, while a diagnostic species is consistently found in some vegetation types but not others.

The field-assessed Alliance name may not always exist in the current MCV, in which case you can provide a new or proposed Alliance name in this field. If this is the case, also make sure to state that it is not in the MCV under "Explain" below.

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 current MCV, in which you can provide a new or proposed 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 in meters from the GPS waypoint and the direction (general or in degrees) of the adjacent alliance (*e.g., Amsinckia tessellata* / 50m, 360° N or *Eriogonum fasciculatum* /--- 100m, 110°).

Confidence in Alliance 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 Alliance 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 can be elaborated upon in the next field or in the Site History.

Other identification or mapping information: Discuss any further problems with the identification of the assessment or issues that may be of interest to mappers. Note if this sample represents a type that is likely too small to map.

IV. VEGETATION DESCRIPTION

Database #: Copy the database # from Page 1.

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 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, and horizontal surfaces (tree branches) but not on standing or inclined trees or vertical rock surfaces.

Total % 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.

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

Height Class by Layer

Note the modal height for conifer tree / hardwood tree, regenerating tree, shrub, and herbaceous categories. Modal height is based on the count of the most frequent height of plants within each layer. Record a modal average height value for each category by estimating the mean height for each group. Please use the following height intervals to record a height class: 1 = <1/2 m, 2 = 1/2-1 m, 3 = 1-2 m, 4 = 2-5 m, 5 = 5-10 m, 6 = 10-15 m, 7 = 15-20 m, 8 = 20-35 m, 9 = 35-50 m, 10 => 50 m.

Note: For the herbaceous layer height, this height class is based on the modal 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 consistent 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. There is a heavy line on the form under the 20th line to limit the RA section of the species list.

Note: 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. ** If using a second species list page, note "Continued" on the bottom of the first page and be sure to note the Database # on the second page.

For both sample types, provide the stratum:

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

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

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

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

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

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

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

In some cases, the stratum of a particular species might not be obvious. Some examples are *Juniperus californica,* which has the size and growth habit of a shrub, but it is considered a tree, and mistletoe, which is considered a shrub. It is useful to have a list of species with ambiguous strata for each project. Consult the MCV or contact VegCAMP if you are unsure.

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, add a "T" to the "C" in the collection column (CT = thrown out after confirmation) or cross out the "C". If the specimen is kept but is still not confidently identified, add a "U" to the "C" 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). If the specimen is later deposited in an herbarium, add a “D” to the existing “C” in the collection column (CD = collected and deposited) and note the receiving herbarium.

Using Jepson eFlora nomenclature, write out the scientific name of each plant to the finest taxonomic level possible. In general, do not abbreviate names 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%.

Record the <1% cover in one of two categories:

> “+” for <1% but not rare or solitary individuals (in most cases)
>
> “r” for rare in plot or solitary individuals.

Keeping these classes in mind, refine your estimate to a specific percentage. The sum of 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 native and non-native species should be included in the species list.

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.

Note: Field forms are generally filled out in pencil, so that changes may be made easily while working in the plot or stand. Once out of the stand, however, entries on the field form should not be erased, but should be crossed out and corrected in a different-colored ink.

[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.

Combined Vegetation Rapid Assessment and Relevé Field Form

(Revised April 27, 2017)

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

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

Database #:	Date:	Name of recorder: AA
NCC04@1	6/2/22	Other surveyors: KG, RB
	Allocation UID: HRSP6	Location Name: HRSP - Grieg Rd.

GPS name: Yucca — For Relevé only: ~~Bearing°, left axis at ID point ____ of Long / Short side~~

~~UTME~~ ~~UTMN~~ ~~Zone: 10~~ NAD83 GPS error: ft / m / PDOP 4.7

Decimal degrees: LAT 40.317261 LONG 123.984927

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

and record: ~~Base point ID ____ Projected UTMs: UTME ____ UTMN ____~~

Camera Name: Yucca Cardinal photos at ID point: 767 - 770 N

Other photos:

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

Exposure, Actual °: 280 NE NW SE SW Flat Variable | Steepness, Actual °: 24 0° 1-5° >5-25° >25

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

Geology code: ____ Soil Texture code: MFSA | Upland or Wetland/Riparian (circle one)

Restoration code: 1-None obvious 2-Juniper removal 3-Grass/forbs seeding 4-Shrub/tree planting 5-Thinning (pine, juniper) 6-Other

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

H_20: 0 BA Stems: / Litter: 96 Bedrock: 0 Boulder: + Stone: + Cobble: + Gravel: | Fines: 2 =100%

% Current year bioturbation + 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: Stand of fairly dense mixed conifer/hardwood PSME/NODE/ARME forest on a steep slope. Canopies are overlapping with minimal gaps, causing herbaceous & shrub cover to be almost non-existant. High hardwood litter cover is also contributing to the lack of herbs. Some logging evidence near road though not many other stumps seen throughout stand.

Disturbance code / Intensity (L,M,H): D61 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: PSME - (NODE - ARME)

Field-assessed Association name (optional): PSME - NODE - ARME

Adjacent Alliances/direction: Can't see. ___/___, ___/___

Confidence in Alliance identification: L M H Explain: Clearly dom sp.

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

Combined Vegetation Rapid Assessment and Relevé Field Form

(Revised April 27, 2017)

Database #: NCC0401 SPECIES SHEET

IV. VEGETATION DESCRIPTION

55

% NonVasc cover: 1 **Total % Vasc Veg cover:** 58

% Cover - **Conifer tree / Hardwood tree:** 25/33 **Regenerating Tree:** 6 **Shrub:** + **Herbaceous:** +

Height Class - **Conifer tree / Hardwood tree:** 7/6 **Regenerating Tree:** 5 **Shrub:** 3 **Herbaceous:** 1

Height classes: 1=<1/2m, 2=1/2-1m, 3=1-2m, 4=2-5m, 5=5-10m, 6=10-15m, 7=15-20m, 8=20-35m, 9=35-50m, 10=>50m

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

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

Stratum	Species	% cover	C	Final species determination
T/A/E	Pseudotsuga menziesii	24/3/+		
T/A/E	Notholithocarpus densiflorus	20/3/+		
T	Arbutus menziesii	13		
T/A/E	Sequoia sempervirens	1/+/+		
E	Umbellularia californica	r		
S	Vaccinium ovatum	+		
H	Vancouveria (planipetala)	+		
H	Iris (douglasii) NIF	+		
H	Polygala californica	+		
H	Goodyera oblongifolia	+		
H	Pyrola aphylla	+		
T/A/E	Snags	+/+/+		
N	Lichen on branches	+		Hypogymnia & usnea
N	Moss on logs/rocks	1		

Unusual species: _____

APPENDIX B: ALLIANCE TARGET LIST

List of alliance targets with lifeform type (Tree, Shrub, Herb), the survey target number, and the number of surveys assigned the field-assessed alliance.

Lifeform	Alliance	Target	Collected
Tree	*Abies amabilis*	5	2
	Abies concolor	25	49
	Abies concolor - Pinus lambertiana	20	18
	Abies concolor - Pseudotsuga menziesii	30	33
	Abies grandis	5	2
	Abies lasiocarpa	8	1
	Abies magnifica	30	71
	Acer macrophyllum	15	17
	Acer negundo	3	0
	Aesculus californica	8	6
	Alnus rhombifolia	20	33
	Alnus rubra	10	8
	Arbutus menziesii	15	12
	Callitropsis nootkatensis	8	4
	Calocedrus decurrens	8	11
	Chamaecyparis lawsoniana	25	29
	Fraxinus latifolia	5	2
	Hesperocyparis (sargentii, macnabiana)	1	0
	Hesperocyparis bakeri	1	3
	Juniperus occidentalis	10	10
	Notholithocarpus densiflorus	25	20
	Picea breweriana	20	23
	Picea engelmannii	10	6
	Pinus albicaulis	20	24
	Pinus attenuata	25	26
	Pinus balfouriana	20	38
	Pinus contorta ssp. *contorta*	5	0
	Pinus contorta ssp. *murrayana*	15	39
	Pinus jeffreyi	30	50
	Pinus lambertiana	15	19
	Pinus monticola	20	36
	Pinus ponderosa	20	20
	Pinus ponderosa - Calocedrus decurrens - Pseudotsuga menziesii	30	50

Lifeform	Alliance	Target	Collected
Tree	*Pinus sabiniana*	15	18
	Populus fremontii - Fraxinus velutina - Salix gooddingii	5	2
	Populus tremuloides	5	4
	Populus trichocarpa	10	15
	Pseudotsuga menziesii - (Notholithocarpus densiflorus - Arbutus menziesii)	60	80
	Pseudotsuga menziesii - Calocedrus decurrens	25	25
	Quercus chrysolepis (tree)	30	44
	Quercus douglasii	15	14
	Quercus garryana (tree)	20	27
	Quercus kelloggii	30	33
	Quercus lobata	2	0
	Quercus lobata Riparian	2	1
	Quercus wislizeni - Quercus parvula (tree)	15	6
	Sequoia sempervirens	2	2
	Tsuga heterophylla	5	2
	Tsuga mertensiana	20	63
	Umbellularia californica	8	4
Shrub	*Acer glabrum*	10	9
	Adenostoma fasciculatum	15	14
	Alnus incana	15	16
	Alnus viridis	10	14
	Alnus viridis - Acer circinatum - Salix sitchensis Montane [proposed]	5	7
	Arctostaphylos (canescens, manzanita, stanfordiana)	10	12
	Arctostaphylos patula - Arctostaphylos nevadensis	25	51
	Arctostaphylos viscida	25	24
	Artemisia arbuscula ssp. *arbuscula*	8	7
	Artemisia tridentata	8	7
	Betula occidentalis	5	3
	Ceanothus cordulatus	10	6
	Ceanothus cuneatus	15	17
	Ceanothus integerrimus	15	14
	Ceanothus velutinus	20	21
	Cephalanthus occidentalis	5	3
	Cercocarpus ledifolius	8	11
	Cercocarpus montanus	5	11
	Chrysolepis sempervirens	8	5
	Cornus sericea - Rosa woodsii - Ribes spp.	5	7

Lifeform	Alliance	Target	Collected
Shrub	*Corylus cornuta* var. *californica*	5	5
	Cytisus scoparius - Genista monspessulana - Cotoneaster spp.	2	1
	Dasiphora fruticosa	8	11
	Ericameria nauseosa	5	12
	Frangula californica - Rhododendron occidentale - Salix breweri	10	8
	Lotus scoparius - Lupinus albifrons - Eriodictyon spp.	10	8
	Notholithocarpus densiflorus var. *echinoides*	10	12
	Prunus emarginata - Holodiscus discolor	15	19
	Prunus virginiana	8	6
	Purshia tridentata - Artemisia tridentata	8	3
	Quercus berberidifolia	5	1
	Quercus durata	8	7
	Quercus garryana (shrub)	20	22
	Quercus sadleriana	8	7
	Quercus vacciniifolia	10	42
	Quercus wislizeni - Quercus chrysolepis (shrub)	15	8
	Rhododendron columbianum	8	6
	Rubus armeniacus - Sesbania punicea - Ficus carica	5	5
	Salix eastwoodiae	5	7
	Salix eastwoodiae - Salix lemmonii [pending]	5	4
	Salix exigua	10	10
	Salix hookeriana - Salix sitchensis - Spiraea douglasii	8	8
	Salix jepsonii	8	6
	Salix lasiolepis	10	13
	Salix scouleriana [pending]	8	2
	Tamarix spp.	3	0
	Vaccinium uliginosum	5	0
	Vitis arizonica - Vitis girdiana	3	2
Herb	*Achnatherum lemmonii - Racomitrium ericoides* [proposed]	10	9
	Agastache urticifolia - Geranium viscosissimum - Pteridium aquilinum [pending]	10	13
	Allium spp. - *Streptanthus* spp. - *Hesperolinon* spp. Serpentinite	10	6
	Aristida purpurea - Elymus elymoides - Poa secunda	8	11
	Avena spp. - *Bromus* spp.	4	3

Lifeform	Alliance	Target	Collected
Herb	*Bidens cernua - Euthamia occidentalis - Ludwigia palustris*	5	0
	Bistorta bistortoides - Mimulus primuloides	8	6
	Bromus carinatus - Elymus glaucus	8	7
	Bromus tectorum - Taeniatherum caput-medusae	4	4
	Carex (aquatilis, lenticularis)	8	3
	Carex (utriculata, vesicaria)	8	9
	Carex echinata	5	5
	Carex limosa	8	2
	Carex nebrascensis	8	6
	Carex nudata	5	8
	Carex spectabilis	8	7
	Carex utriculata - Calamagrostis canadensis [pending]	10	36
	Cistanthe (umbellata) - Gayophytum (diffusum)	8	9
	Cynodon dactylon - Crypsis spp. *- Paspalum* spp.	3	1
	Cynosurus echinatus - Arrhenatherum elatius	4	1
	Danthonia californica - Deschampsia cespitosa - Camassia quamash	25	25
	Danthonia intermedia	5	5
	Darlingtonia californica	24	38
	Distichlis spicata	5	3
	Dulichium arundinaceum	8	4
	Eleocharis quinqueflora	5	1
	Eleocharis (acicularis, macrostachya)	10	11
	Festuca idahoensis - Danthonia californica	5	14
	Festuca idahoensis - Pseudoroegneria spicata - Poa secunda	8	14
	Festuca idahoensis ssp. *roemeri - Arctostaphylos* spp. *Interior Balds* [proposed]	5	2
	Festuca viridula - Carex hoodii - Lupinus spp. [proposed]	5	2
	Hydrilla verticillata - Myriophyllum spicatum	5	1
	Hydrocotyle (ranunculoides, umbellata)	1	1
	Juncus (effusus, patens) - Carex (pansa, praegracilis)	10	6
	*Juncus arcticus (*var. *balticus, mexicanus)*	5	18
	Juncus parryi	5	4
	Leymus cinereus - Leymus triticoides	5	0
	Ligusticum spp. *- Lupinus* spp. *- Delphinium* spp. [proposed]	10	13
	Mimulus guttatus - Cirsium spp. *- Stachys* spp.	8	9

Lifeform	Alliance	Target	Collected
Herb	*Minuartia obtusiloba - Lupinus sellulus* [proposed]	5	0
	Nassella spp. - *Melica* spp.	5	1
	Nuphar lutea	8	11
	Penstemon newberryi	8	5
	Phalaris aquatica - Phalaris arundinacea	3	7
	Phlox covillei	5	1
	Phlox spp. - *Lomatium* spp. - *Carex* spp. [proposed]	5	4
	Phragmites australis - Arundo donax	3	0
	Poa pratensis - Agrostis gigantea - Agrostis stolonifera	5	8
	Poa secunda - Muhlenbergia richardsonis - Carex douglasii	5	4
	Polygonum davisiae - Eriogonum marifolium - Arenaria pumicola [proposed]	10	27
	Schoenoplectus americanus	5	1
	Scirpus microcarpus	5	9
	Selaginella (bigelovii, wallacei)	5	5
	Senecio triangularis	8	1
	Sparganium (angustifolium)	5	9
	Torreyochloa pallida	8	0
	Triantha occidentalis - Narthecium californicum	15	35
	Typha (angustifolia, domingensis, latifolia)	4	4
	Valeriana sitchensis - Luzula glabrata var. *hitchcockii - Xerophyllum tenax* [proposed]	10	14
	Utricularia macrorhiza - Utricularia minor - Utricularia ochroleuca [proposed]	5	0
	Veratrum californicum	8	11

APPENDIX C: PLANT LIST FOR THE KLAMATH MOUNTAINS PROJECT

List of plants observed during CNPS-led sampling in the Klamath Mountains study area between 2023 – 2025.

Abies concolor
Abies grandis
Abies lasiocarpa
Abies magnifica
Abies magnifica var. *shastensis*
Abies procera
Acacia dealbata
Acer circinatum
Acer glabrum
Acer glabrum var. *glabrum*
Acer macrophyllum
Achillea millefolium
Achlys californica
Achlys triphylla
Achnatherum lemmonii
Achnatherum lemmonii ssp. *lemmonii*
Achnatherum nelsonii
Achnatherum nelsonii ssp. *dorei*
Achnatherum occidentale
Achnatherum occidentale ssp. *californicum*
Achnatherum occidentale ssp. *occidentale*
Achnatherum occidentale ssp. *pubescens*
Achyrachaena mollis
Acmispon americanus
Acmispon brachycarpus
Acmispon decumbens var. *decumbens*
Acmispon grandiflorus
Acmispon grandiflorus var. *grandiflorus*
Acmispon parviflorus
Aconitum columbianum
Aconitum columbianum ssp. *columbianum*
Aconitum columbianum ssp. *viviparum*
Aconogonon phytolaccifolium
Actaea rubra
Adelinia grandis
Adenocaulon bicolor
Adenostoma fasciculatum
Adiantum aleuticum
Adiantum shastense
Aesculus californica
Agastache urticifolia
Ageratina occidentalis
Agoseris aurantiaca
Agoseris aurantiaca var. *aurantiaca*
Agoseris grandiflora
Agoseris grandiflora var. *leptophylla*
Agoseris heterophylla
Agoseris retrorsa
Agropyron cristatum
Agrostis exarata
Agrostis gigantea
Agrostis humilis
Agrostis pallens
Agrostis scabra
Agrostis stolonifera
Agrostis variabilis
Ailanthus altissima
Aira caryophyllea
Allium acuminatum
Allium amplectens
Allium bolanderi
Allium bolanderi var. *bolanderi*
Allium campanulatum
Allium falcifolium
Allium hoffmanii
Allium membranaceum
Allium siskiyouense
Allium validum
Allotropa virgata
Alnus incana
Alnus incana ssp. *tenuifolia*
Alnus rhombifolia
Alnus rubra
Alnus viridis
Alnus viridis ssp. *sinuata*

Alopecurus pratensis
Alyssum alyssoides
Alyssum desertorum
Amauropelta nevadensis
Amelanchier alnifolia
Amelanchier alnifolia var. *semiintegrifolia*
Amelanchier pallida
Amelanchier utahensis
Amsinckia intermedia
Amsinckia menziesii
Anaphalis margaritacea
Andersonglossum occidentale
Anemone deltoidea
Anemone drummondii
Anemone drummondii var. *drummondii*
Anemone grayi
Anemone oregana
Angelica arguta
Angelica tomentosa
Anisocarpus madioides
Antennaria argentea
Antennaria dimorpha
Antennaria media
Antennaria microphylla
Antennaria racemosa
Antennaria rosea
Antennaria rosea ssp. *confinis*
Antennaria rosea ssp. *rosea*
Antennaria suffrutescens
Anthoxanthum aristatum
Anthoxanthum occidentale
Anthoxanthum odoratum
Anthriscus caucalis
Aphanes occidentalis
Aphyllon epigalium ssp. *epigalium*
Aphyllon fasciculatum
Aphyllon franciscanum
Aphyllon purpureum
Apocynum androsaemifolium
Aquilegia formosa
Aralia californica
Arbutus menziesii
Arceuthobium campylopodum
Arctostaphylos canescens
Arctostaphylos canescens ssp. *canescens*
Arctostaphylos canescens ssp. *sonomensis*
Arctostaphylos glandulosa
Arctostaphylos glandulosa ssp. *glandulosa*
Arctostaphylos hispidula
Arctostaphylos klamathensis
Arctostaphylos malloryi
Arctostaphylos manzanita
Arctostaphylos manzanita ssp. *manzanita*
Arctostaphylos nevadensis
Arctostaphylos nevadensis ssp. *nevadensis*
Arctostaphylos nortensis
Arctostaphylos patula
Arctostaphylos patula ssp. *patula*
Arctostaphylos viscida
Arctostaphylos viscida ssp. *pulchella*
Arctostaphylos viscida ssp. *viscida*
Arenaria serpyllifolia ssp. *serpyllifolia*
Aristolochia californica
Arnica cernua
Arnica cordifolia
Arnica discoidea
Arnica lanceolata ssp. *prima*
Arnica latifolia
Arnica mollis
Arnica nevadensis
Arnica parryi
Arnica spathulata
Arnica viscosa
Artemisia arbuscula
Artemisia arbuscula ssp. *arbuscula*
Artemisia borealis ssp. *borealis*
Artemisia douglasiana
Artemisia ludoviciana
Artemisia norvegica ssp. *saxatilis*
Artemisia tridentata
Artemisia tridentata ssp. *tridentata*
Artemisia tridentata ssp. *vaseyana*
Aruncus dioicus
Asarum caudatum
Asarum hartwegii

Asclepias cordifolia
Asclepias fascicularis
Asclepias solanoana
Asclepias speciosa
Aspidotis densa
Astragalus californicus
Astragalus parishii
Astragalus purshii
Astragalus purshii var. *tinctus*
Astragalus whitneyi
Astragalus whitneyi var. *siskiyouensis*
Asyneuma prenanthoides
Athyrium distentifolium var. *americanum*
Athyrium filix-femina
Athyrium filix-femina var. *cyclosorum*
Athysanus pusillus
Avena barbata
Avena fatua
Avena sativa
Baccharis pilularis
Balsamorhiza deltoidea
Balsamorhiza sagittata
Balsamorhiza sericea
Barbarea orthoceras
Barbarea vulgaris
Berberis aquifolium
Berberis aquifolium var. *dictyota*
Berberis aquifolium var. *repens*
Berberis nervosa
Betula occidentalis
Bistorta bistortoides
Blepharipappus scaber
Boechera breweri
Boechera breweri ssp. *breweri*
Boechera howellii
Boechera pauciflora
Boechera pinetorum
Boechera pratincola
Boechera retrofracta
Boechera serpenticola
Boechera suffrutescens
Botrychium multifidum
Boykinia major
Boykinia occidentalis
Brachypodium distachyon
Brasenia schreberi
Brassica nigra
Brickellia californica
Brickellia greenei
Briza maxima
Briza minor
Brodiaea elegans
Brodiaea elegans ssp. *elegans*
Bromelica subulata
Bromus carinatus
Bromus carinatus var. *marginatus*
Bromus diandrus
Bromus hordeaceus
Bromus laevipes
Bromus orcuttianus
Bromus rubens
Bromus sitchensis
Bromus sterilis
Bromus suksdorfii
Bromus tectorum
Bromus vulgaris
Cacaliopsis nardosmia
Calamagrostis breweri
Calamagrostis canadensis
Calamagrostis canadensis var. *langsdorffii*
Calamagrostis koelerioides
Calamagrostis nutkaensis
Calamagrostis purpurascens
Calamagrostis stricta ssp. *inexpansa*
Calliscirpus criniger
Callitropsis nootkatensis
Calocedrus decurrens
Calochortus elegans
Calochortus nudus
Calochortus persistens
Calochortus tolmiei
Caltha leptosepala
Calycadenia fremontii
Calycadenia micrantha
Calycanthus occidentalis
Calypso bulbosa
Calyptridium monospermum
Calyptridium umbellatum
Calystegia malacophylla

Calystegia malacophylla ssp. *malacophylla*
Calystegia occidentalis
Calystegia occidentalis ssp. *occidentalis*
Camissonia contorta
Campanula scabrella
Campanula scouleri
Cardamine breweri
Cardamine californica
Cardamine hirsuta
Cardamine nuttallii
Cardamine nuttallii var. *covilleana*
Cardamine occidentalis
Carduus pycnocephalus
Carex amplifolia
Carex angustata
Carex aquatilis
Carex aquatilis var. *aquatilis*
Carex aquatilis var. *dives*
Carex athrostachya
Carex aurea
Carex barbarae
Carex bolanderi
Carex brainerdii
Carex breweri
Carex buxbaumii
Carex concinnoides
Carex cusickii
Carex densa
Carex divulsa ssp. *divulsa*
Carex douglasii
Carex echinata
Carex echinata ssp. *echinata*
Carex exsiccata
Carex feta
Carex geyeri
Carex halliana
Carex harfordii
Carex hassei
Carex hoodii
Carex infirminervia
Carex inops ssp. *inops*
Carex integra
Carex interior
Carex jonesii
Carex klamathensis
Carex laeviculmis
Carex lenticularis var. *impressa*
Carex lenticularis var. *lipocarpa*
Carex leptopoda
Carex limosa
Carex luzulifolia
Carex luzulina
Carex mendocinensis
Carex mertensii
Carex microptera
Carex multicaulis
Carex multicostata
Carex nebrascensis
Carex neurophora
Carex nigricans
Carex nudata
Carex obnupta
Carex pachycarpa
Carex pachystachya
Carex pellita
Carex preslii
Carex raynoldsii
Carex rossii
Carex scabriuscula
Carex scopulorum
Carex scopulorum var. *bracteosa*
Carex serpenticola
Carex serratodens
Carex simulata
Carex spectabilis
Carex stipata var. *stipata*
Carex subbracteata
Carex subfusca
Carex utriculata
Carex vernacula
Carex vesicaria
Cassiope mertensiana
Castilleja affinis
Castilleja affinis ssp. *affinis*
Castilleja applegatei
Castilleja applegatei ssp. *pinetorum*
Castilleja arachnoidea
Castilleja attenuata
Castilleja lacera

Castilleja miniata
Castilleja miniata ssp. *miniata*
Castilleja pruinosa
Castilleja tenuis
Ceanothus arcuatus
Ceanothus cordulatus
Ceanothus cuneatus
Ceanothus cuneatus var. *cuneatus*
Ceanothus integerrimus
Ceanothus integerrimus var. *macrothyrsus*
Ceanothus lemmonii
Ceanothus pinetorum
Ceanothus prostratus
Ceanothus prostratus var. *prostratus*
Ceanothus pumilus
Ceanothus sanguineus
Ceanothus velutinus
Centaurea solstitialis
Cephalanthera austiniae
Cephalanthus occidentalis
Cerastium arvense
Cerastium arvense ssp. *strictum*
Cerastium fontanum
Cerastium glomeratum
Ceratophyllum demersum
Cercis occidentalis
Cercocarpus betuloides
Cercocarpus betuloides var. *betuloides*
Cercocarpus betuloides var. *macrourus*
Cercocarpus ledifolius
Cercocarpus ledifolius var. *intermontanus*
Chaenactis douglasii
Chaenactis douglasii var. *douglasii*
Chaenactis suffrutescens
Chamaecyparis lawsoniana
Chamerion angustifolium
Chimaphila menziesii
Chimaphila umbellata
Chlorogalum pomeridianum
Chlorogalum pomeridianum var. *pomeridianum*
Chrysolepis chrysophylla
Chrysolepis chrysophylla var. *chrysophylla*
Chrysolepis chrysophylla var. *minor*
Chrysolepis sempervirens
Cichorium intybus
Cicuta maculata var. *angustifolia*
Circaea alpina
Circaea alpina ssp. *pacifica*
Cirsium andersonii
Cirsium arvense
Cirsium cymosum
Cirsium cymosum var. *cymosum*
Cirsium douglasii
Cirsium douglasii var. *breweri*
Cirsium douglasii var. *douglasii*
Cirsium occidentale
Cirsium scariosum
Cirsium vulgare
Clarkia concinna
Clarkia gracilis
Clarkia gracilis ssp. *gracilis*
Clarkia heterandra
Clarkia purpurea
Clarkia purpurea ssp. *quadrivulnera*
Clarkia rhomboidea
Claytonia exigua
Claytonia lanceolata
Claytonia obovata
Claytonia parviflora
Claytonia parviflora ssp. *parviflora*
Claytonia perfoliata
Claytonia rubra
Claytonia rubra ssp. *depressa*
Claytonia rubra ssp. *rubra*
Claytonia serpenticola
Claytonia sibirica
Clematis lasiantha
Clematis ligusticifolia
Clinopodium douglasii
Clintonia uniflora
Collinsia grandiflora
Collinsia greenei
Collinsia linearis
Collinsia parviflora
Collinsia rattanii
Collinsia sparsiflora
Collinsia tinctoria

Collinsia torreyi
Collinsia torreyi var. *latifolia*
Collomia grandiflora
Collomia heterophylla
Collomia linearis
Collomia tinctoria
Collomia tracyi
Comandra umbellata
Comandra umbellata ssp. *californica*
Conium maculatum
Convolvulus occidentalis
Corallorhiza maculata
Corallorhiza mertensiana
Corallorhiza striata
Corallorhiza maculata
Corallorhiza mertensiana
Cordylanthus pilosus
Cordylanthus tenuis
Cordylanthus tenuis ssp. *viscidus*
Cornus glabrata
Cornus nuttallii
Cornus sericea
Cornus sericea ssp. *sericea*
Cornus sessilis
Corylus cornuta
Crassula tillaea
Crataegus douglasii
Crepis acuminata
Crepis intermedia
Crepis occidentalis ssp. *conjuncta*
Crepis pleurocarpa
Croton setigerus
Crucianella angustifolia
Crypsis alopecuroides
Cryptantha affinis
Cryptantha milobakeri
Cryptantha milo-bakeri
Cryptantha simulans
Cryptantha torreyana var. *torreyana*
Cryptogramma acrostichoides
Cuscuta occidentalis
Cycladenia humilis
Cymopterus terebinthinus
Cynosurus cristatus
Cynosurus echinatus
Cyperus eragrostis
Cyperus squarrosus
Cypripedium californicum
Cystopteris fragilis
Dactylis glomerata
Danthonia californica
Danthonia intermedia
Danthonia unispicata
Darlingtonia californica
Darmera peltata
Dasiphora fruticosa
Datisca glomerata
Daucus carota
Daucus pusillus
Delphinium decorum
Delphinium decorum ssp. *tracyi*
Delphinium glaucum
Delphinium nudicaule
Delphinium nuttallianum
Dendromecon rigida
Deschampsia cespitosa
Deschampsia cespitosa ssp. *cespitosa*
Deschampsia danthonioides
Deschampsia elongata
Descurainia incisa
Dicentra formosa
Dicentra pauciflora
Dicentra uniflora
Dichelostemma congestum
Dichelostemma ida-maia
Dichelostemma multiflorum
Dichelostemma volubile
Dieteria canescens
Dieteria canescens var. *shastensis*
Digitalis purpurea
Diplacus aurantiacus
Diplacus mephiticus
Dipsacus fullonum
Dipterostemon capitatus
Dipterostemon capitatus ssp. *capitatus*
Distichlis spicata
Dodecatheon alpinum
Doellingeria tomentella
Downingia bacigalupii
Downingia pulcherrima

Downingia yina
Draba pterosperma
Draba verna
Draperia systyla
Drosera rotundifolia
Drymocallis glandulosa
Drymocallis glandulosa var. *glandulosa*
Drymocallis lactea
Drymocallis lactea var. *austiniae*
Drymocallis pseudorupestris
Drymocallis pseudorupestris var. *saxicola*
Drymocallis rhomboidea
Dryopteris arguta
Dulichium arundinaceum
Dulichium arundinaceum var. *arundinaceum*
Echinochloa crus-galli
Eleocharis acicularis
Eleocharis bella
Eleocharis decumbens
Eleocharis macrostachya
Eleocharis palustris
Eleocharis parishii
Eleocharis rostellata
Elodea canadensis
Elymus elymoides
Elymus elymoides ssp. *californicus*
Elymus elymoides ssp. *elymoides*
Elymus glaucus
Elymus glaucus ssp. *glaucus*
Elymus lanceolatus
Elymus multisetus
Elymus spicatus
Elymus trachycaulus
Elymus trachycaulus ssp. *trachycaulus*
Elymus triticoides
Epilobium brachycarpum
Epilobium canum
Epilobium ciliatum
Epilobium ciliatum ssp. *ciliatum*
Epilobium ciliatum ssp. *glandulosum*
Epilobium foliosum
Epilobium glaberrimum ssp. *glaberrimum*
Epilobium halleanum
Epilobium hornemannii ssp. *hornemannii*
Epilobium minutum
Epilobium oreganum
Epilobium pallidum
Epilobium siskiyouense
Epipactis gigantea
Equisetum arvense
Equisetum hyemale
Equisetum laevigatum
Equisetum telmateia
Equisetum telmateia ssp. *braunii*
Eremogone congesta
Eremogone congesta var. *crassula*
Eremogone congesta var. *suffrutescens*
Eremogone kingii
Eriastrum tracyi
Ericameria bloomeri
Ericameria greenei
Ericameria nauseosa
Ericameria nauseosa ssp. *nauseosa*
Ericameria nauseosa var. *speciosa*
Ericameria ophitidis
Erigeron aliceae
Erigeron bloomeri
Erigeron bloomeri var. *bloomeri*
Erigeron bloomeri var. *nudatus*
Erigeron compositus
Erigeron divergens
Erigeron filifolius
Erigeron foliosus var. *confinis*
Erigeron glacialis
Erigeron glacialis var. *glacialis*
Erigeron glacialis var. *hirsutus*
Erigeron inornatus
Erigeron inornatus var. *inornatus*
Erigeron lassenianus var. *lassenianus*
Erigeron petrophilus
Erigeron petrophilus var. *viscidulus*
Erigeron pumilus ssp. *intermedius*
Erigeron reductus var. *reductus*
Erigeron tener
Eriodictyon californicum
Eriodictyon lobbii
Eriogonum alpinum
Eriogonum compositum
Eriogonum compositum var. *compositum*

Eriogonum congdonii
Eriogonum dasyanthemum
Eriogonum diclinum
Eriogonum douglasii
Eriogonum douglasii var. *meridionale*
Eriogonum elatum
Eriogonum elatum var. *elatum*
Eriogonum libertini
Eriogonum lobbii
Eriogonum luteolum
Eriogonum luteolum var. *luteolum*
Eriogonum marifolium
Eriogonum marifolium var. *marifolium*
Eriogonum nanum
Eriogonum nudum
Eriogonum nudum var. *nudum*
Eriogonum ovalifolium
Eriogonum ovalifolium var. *purpureum*
Eriogonum pendulum
Eriogonum siskiyouense
Eriogonum sphaerocephalum
Eriogonum strictum var. *greenei*
Eriogonum ternatum
Eriogonum umbellatum
Eriogonum umbellatum var. *argus*
Eriogonum umbellatum var. *dumosum*
Eriogonum umbellatum var. *goodmanii*
Eriogonum umbellatum var. *humistratum*
Eriogonum umbellatum var. *lautum*
Eriogonum umbellatum var. *modocense*
Eriogonum umbellatum var. *nelsoniorum*
Eriogonum ursinum var. *erubescens*
Eriogonum vimineum
Eriophorum gracile
Eriophyllum lanatum
Eriophyllum lanatum var. *achillaeoides*
Eriophyllum lanatum var. *grandiflorum*
Eriophyllum lanatum var. *integrifolium*
Eriophyllum lanatum var. *lanceolatum*
Erodium brachycarpum
Erodium cicutarium
Erodium moschatum
Erysimum capitatum
Erysimum capitatum var. *capitatum*
Erysimum perenne
Erythranthe cardinalis
Erythranthe lewisii
Erythranthe linearifolia
Erythranthe microphylla
Erythranthe moschata
Erythranthe primuloides
Erythranthe tilingii
Erythranthe trinitiensis
Erythronium californicum
Erythronium citrinum
Erythronium citrinum var. *citrinum*
Erythronium grandiflorum
Erythronium klamathense
Erythronium multiscapoideum
Eschscholzia californica
Eucephalus breweri
Eucephalus ledophyllus
Eucephalus ledophyllus var. *covillei*
Euonymus occidentalis var. *occidentalis*
Eurybia radulina
Euthamia occidentalis
Festuca arundinacea
Festuca bromoides
Festuca californica
Festuca elmeri
Festuca idahoensis
Festuca occidentalis
Festuca subulata
Festuca viridula
Fragaria vesca
Fragaria virginiana
Frangula californica
Frangula californica ssp. *californica*
Frangula californica ssp. *crassifolia*
Frangula californica ssp. *occidentalis*
Frangula californica ssp. *tomentella*
Frangula purshiana
Frangula purshiana ssp. *annonifolia*
Frangula purshiana ssp. *purshiana*
Frangula rubra
Frangula rubra ssp. *obtusissima*
Frangula rubra ssp. *rubra*
Frasera albicaulis
Frasera albicaulis var. *nitida*
Frasera speciosa

Fraxinus dipetala
Fraxinus latifolia
Fremontodendron californicum
Fritillaria affinis
Fritillaria atropurpurea
Fritillaria recurva
Galium ambiguum
Galium ambiguum ssp. *ambiguum*
Galium ambiguum ssp. *siskiyouense*
Galium aparine
Galium bifolium
Galium bolanderi
Galium boreale
Galium glabrescens
Galium glabrescens ssp. *glabrescens*
Galium grayanum
Galium parisiense
Galium porrigens
Galium serpenticum
Galium serpenticum ssp. *scotticum*
Galium trifidum
Galium trifidum ssp. *columbianum*
Galium triflorum
Garrya buxifolia
Garrya congdonii
Garrya flavescens
Garrya fremontii
Gastridium phleoides
Gaultheria humifusa
Gaultheria ovatifolia
Gaultheria shallon
Gayophytum diffusum
Gayophytum diffusum ssp. *parviflorum*
Gayophytum heterozygum
Gayophytum humile
Genista monspessulana
Gentiana affinis var. *ovata*
Gentiana calycosa
Gentiana newberryi
Gentiana newberryi var. *newberryi*
Gentianella amarella
Gentianopsis simplex
Geranium dissectum
Geranium molle
Geum macrophyllum
Geum macrophyllum ssp. *perincisum*
Gilia capitata
Gilia capitata ssp. *capitata*
Gilia capitata ssp. *pacifica*
Gilia tricolor
Githopsis specularioides
Glyceria borealis
Glyceria elata
Glyceria striata
Goodyera oblongifolia
Grindelia camporum
Hackelia bella
Hackelia micrantha
Hackelia setosa
Harmonia doris-nilesiae
Hastingsia alba
Hastingsia serpentinicola
Hazardia whitneyi
Hazardia whitneyi var. *discoidea*
Helenium bigelovii
Helenium puberulum
Helianthella californica
Helianthella californica var. *shastensis*
Hemizonella minima
Hemizonia congesta
Heracleum maximum
Hesperocyparis bakeri
Hesperolinon micranthum
Heterocodon rariflorum
Heteromeles arbutifolia
Heterotheca oregona
Heterotheca villosa var. *minor*
Heuchera merriamii
Heuchera micrantha
Hieracium albiflorum
Hieracium bolanderi
Hieracium greenei
Hieracium horridum
Hieracium nudicaule
Hieracium parryi
Hieracium scouleri
Hieracium triste
Hirschfeldia incana
Holcus lanatus
Holodiscus discolor

Holodiscus discolor var. *glabrescens*
Hordeum brachyantherum
Horkelia daucifolia
Horkelia daucifolia ssp. *daucifolia*
Horkelia tridentata
Horkelia tridentata ssp. *flavescens*
Hosackia crassifolia
Hosackia oblongifolia
Hosackia oblongifolia var. *oblongifolia*
Hosackia pinnata
Hosackia rosea
Howellanthus dalesianus
Hulsea nana
Hydrocotyle verticillata
Hydrophyllum capitatum
Hydrophyllum capitatum var. *alpinum*
Hydrophyllum occidentale
Hydrophyllum tenuipes
Hypericum anagalloides
Hypericum concinnum
Hypericum perforatum
Hypericum scouleri
Hypochaeris glabra
Hypochaeris radicata
Ipomopsis aggregata
Ipomopsis aggregata ssp. *aggregata*
Ipomopsis congesta ssp. *montana*
Iris chrysophylla
Iris hartwegii
Iris macrosiphon
Iris purdyi
Iris tenuissima
Iris tenuissima ssp. *tenuissima*
Iris thompsonii
Isatis tinctoria
Isoetes bolanderi
Isoetes echinospora
Isoetes occidentalis
Ivesia gordonii
Ivesia gordonii var. *alpicola*
Ivesia gordonii var. *ursinorum*
Ivesia pickeringii
Juncus acuminatus
Juncus articulatus
Juncus balticus ssp. *ater*
Juncus bufonius
Juncus confusus
Juncus drummondii
Juncus effusus
Juncus ensifolius
Juncus howellii
Juncus mertensianus
Juncus mexicanus
Juncus nevadensis
Juncus nevadensis var. *nevadensis*
Juncus occidentalis
Juncus orthophyllus
Juncus oxymeris
Juncus parryi
Juncus patens
Juniperus communis
Juniperus communis var. *jackii*
Juniperus occidentalis
Kalmia microphylla
Keckiella corymbosa
Keckiella lemmonii
Kelloggia galioides
Koeleria macrantha
Kopsiopsis strobilacea
Kyhosia bolanderi
Lactuca serriola
Lactuca virosa
Lagophylla ramosissima
Lapsana communis
Lathyrus delnorticus
Lathyrus jepsonii
Lathyrus jepsonii ssp. *californicus*
Lathyrus lanszwertii var. *tracyi*
Lathyrus latifolius
Lathyrus nevadensis
Lathyrus polyphyllus
Lathyrus sulphureus
Lathyrus vestitus
Leersia oryzoides
Lemna minor
Lepidium campestre
Lepidium nitidum
Lepidium strictum
Leptosiphon bolanderi
Leptosiphon ciliatus

Leptosiphon harknessii
Leptosiphon nuttallii
Leptosiphon nuttallii ssp. *howellii*
Leptosiphon parviflorus
Lessingia nemaclada
Leucanthemum vulgare
Leucothoe davisiae
Lewisia ×whiteae
Lewisia cotyledon
Lewisia cotyledon var. *cotyledon*
Lewisia cotyledon var. *heckneri*
Lewisia kelloggii
Lewisia leeana
Lewisia nevadensis
Lewisia oppositifolia
Lewisia rediviva
Lewisia rediviva var. *rediviva*
Lewisia triphylla
Lewisia x whiteae
Ligusticum californicum
Ligusticum grayi
Lilium bolanderi
Lilium pardalinum
Lilium pardalinum ssp. *pardalinum*
Lilium pardalinum ssp. *shastense*
Lilium pardalinum ssp. *wigginsii*
Lilium washingtonianum
Lilium washingtonianum ssp. *purpurascens*
Limnanthes floccosa
Linanthus pungens
Linaria dalmatica
Linaria dalmatica ssp. *dalmatica*
Linnaea borealis
Linum lewisii
Linum lewisii var. *lewisii*
Listera convallarioides
Lithophragma affine
Lithophragma heterophyllum
Lithophragma parviflorum
Lithospermum californicum
Logfia gallica
Lolium perenne
Lomatium californicum
Lomatium dasycarpum
Lomatium dissectum
Lomatium engelmannii
Lomatium macrocarpum
Lomatium multifidum
Lomatium nudicaule
Lomatium peckianum
Lomatium tracyi
Lomatium triternatum
Lomatium triternatum var. *triternatum*
Lomatium utriculatum
Lomatium vaginatum
Lonicera ciliosa
Lonicera conjugialis
Lonicera hispidula
Lonicera interrupta
Lonicera involucrata
Lotus nevadensis
Lotus nevadensis var. *douglasii*
Ludwigia palustris
Luetkea pectinata
Luina hypoleuca
Lupinus albicaulis
Lupinus albifrons
Lupinus albifrons var. *collinus*
Lupinus andersonii
Lupinus bicolor
Lupinus croceus
Lupinus latifolius
Lupinus latifolius ssp. *viridifolius*
Lupinus latifolius var. *latifolius*
Lupinus latifolius var. *viridifolius*
Lupinus lepidus
Lupinus lepidus var. *sellulus*
Lupinus leucophyllus
Lupinus nanus
Lupinus onustus
Lupinus tracyi
Luzula comosa
Luzula comosa var. *laxa*
Luzula divaricata
Luzula parviflora
Luzula subcongesta
Lysichiton americanus
Lysimachia latifolia
Lythrum hyssopifolia

Madia citriodora
Madia elegans
Madia exigua
Madia glomerata
Madia gracilis
Maianthemum racemosum
Maianthemum stellatum
Marah fabacea
Marah watsonii
Marrubium vulgare
Matricaria discoidea
Medicago lupulina
Medicago sativa
Melica bulbosa
Melica californica
Melica fugax
Melica geyeri
Melica geyeri var. *geyeri*
Melica harfordii
Melica spectabilis
Melica subulata
Melica torreyana
Melilotus albus
Melilotus officinalis
Melissa officinalis
Mentha aquatica
Mentha canadensis
Mentzelia dispersa
Menyanthes trifoliata
Micranthes aprica
Micranthes bryophora
Micranthes ferruginea
Micranthes marshallii
Micranthes nidifica
Micranthes oregana
Micranthes tolmiei
Micropus californicus
Micropus californicus var. *californicus*
Microseris laciniata
Microseris nutans
Microsteris gracilis
Mimulus breweri
Mimulus floribundus
Mimulus guttatus
Mimulus layneae
Moehringia macrophylla
Mollugo verticillata
Monardella odoratissima
Monardella odoratissima ssp. *pallida*
Monardella odoratissima var. *glauca*
Monardella purpurea
Monardella sheltonii
Monardella villosa
Monotropa hypopitys
Montia chamissoi
Montia fontana
Montia parvifolia
Muhlenbergia andina
Muhlenbergia filiformis
Muhlenbergia montana
Muhlenbergia richardsonis
Myosotis laxa
Myriophyllum spicatum
Myriopteris gracillima
Najas flexilis
Narthecium californicum
Nasturtium officinale
Navarretia capillaris
Navarretia intertexta
Navarretia intertexta ssp. *intertexta*
Navarretia linearifolia ssp. *linearifolia*
Nemophila heterophylla
Nemophila parviflora
Neottia banksiana
Nerium oleander
Neviusia cliftonii
Noccaea fendleri
Noccaea fendleri ssp. *glauca*
Nothochelone nemorosa
Notholithocarpus densiflorus
Notholithocarpus densiflorus var. *densiflorus*
Notholithocarpus densiflorus var. *echinoides*
Nuphar lutea ssp. *polysepala*
Odontostomum hartwegii
Oemleria cerasiformis
Oreostemma alpigenum
Oreostemma alpigenum var. *andersonii*
Orthilia secunda

Orthocarpus cuspidatus
Orthocarpus cuspidatus ssp. *copelandii*
Orthocarpus imbricatus
Osmorhiza berteroi
Osmorhiza occidentalis
Oxalis oregana
Oxalis trilliifolia
Oxypolis occidentalis
Ozomelis diversifolia
Ozomelis trifida
Packera cana
Packera greenei
Packera macounii
Paeonia brownii
Panicum acuminatum
Panicum capillare
Parnassia cirrata
Parnassia cirrata var. *intermedia*
Parnassia palustris
Paspalum distichum
Paxistima myrsinites
Pectiantia pentandra
Pectocarya pusilla
Pedicularis attollens
Pedicularis bracteosa
Pedicularis contorta
Pedicularis densiflora
Pedicularis racemosa
Pellaea brachyptera
Pellaea mucronata
Penstemon anguineus
Penstemon azureus
Penstemon azureus var. *azureus*
Penstemon davidsonii
Penstemon davidsonii var. *davidsonii*
Penstemon deustus
Penstemon deustus var. *deustus*
Penstemon filiformis
Penstemon laetus
Penstemon laetus ssp. *sagittatus*
Penstemon newberryi
Penstemon newberryi var. *berryi*
Penstemon parvulus
Penstemon procerus
Penstemon procerus var. *formosus*
Penstemon roezlii
Penstemon rupicola
Penstemon speciosus
Pentagramma triangularis
Perideridia bolanderi ssp. *bolanderi*
Perideridia kelloggii
Perideridia oregana
Perideridia parishii
Perideridia parishii ssp. *latifolia*
Persicaria lapathifolia
Petasites frigidus
Petrorhagia dubia
Phacelia bolanderi
Phacelia corymbosa
Phacelia hastata
Phacelia hastata var. *hastata*
Phacelia heterophylla
Phacelia linearis
Phacelia mutabilis
Phacelia pringlei
Phacelia procera
Phacelia racemosa
Phacelia ramosissima
Phalaris aquatica
Phalaris arundinacea
Phalaris minor
Philadelphus lewisii
Phleum alpinum
Phleum pratense
Phlox adsurgens
Phlox diffusa
Phlox speciosa
Phoradendron juniperinum
Phoradendron leucarpum
Phoradendron leucarpum ssp. *tomentosum*
Phyllodoce empetriformis
Physaria occidentalis
Physocarpus capitatus
Picea breweriana
Picea engelmannii
Pinguicula macroceras
Pinus albicaulis
Pinus attenuata
Pinus balfouriana

Pinus contorta
Pinus contorta ssp. *murrayana*
Pinus jeffreyi
Pinus lambertiana
Pinus monticola
Pinus ponderosa
Pinus sabiniana
Piperia candida
Piperia elongata
Piperia transversa
Pityopus californica
Plagiobothrys bracteatus
Plagiobothrys greenei
Plagiobothrys tenellus
Plantago erecta
Plantago lanceolata
Plantago major
Platanthera dilatata
Platanthera dilatata var. *angustifolia*
Platanthera dilatata var. *leucostachys*
Platanthera sparsiflora
Platanthera stricta
Platanthera unalascensis
Plectritis congesta
Plectritis macrocera
Pleuricospora fimbriolata
Poa annua
Poa bolanderi
Poa bulbosa
Poa compressa
Poa cusickii ssp. *cusickii*
Poa cusickii ssp. *epilis*
Poa cusickii ssp. *purpurascens*
Poa howellii
Poa palustris
Poa piperi
Poa pratensis
Poa pratensis ssp. *pratensis*
Poa pringlei
Poa secunda
Poa secunda ssp. *juncifolia*
Poa secunda ssp. *secunda*
Poa wheeleri
Polemonium californicum
Polemonium eddyense
Polemonium pulcherrimum
Polygala californica
Polygala cornuta
Polygonum californicum
Polygonum davisiae
Polygonum douglasii
Polygonum minimum
Polygonum polygaloides
Polygonum polygaloides ssp. *confertiflorum*
Polygonum polygaloides ssp. *kelloggii*
Polygonum sawatchense
Polygonum sawatchense ssp. *sawatchense*
Polygonum spergulariiforme
Polypodium calirhiza
Polypodium glycyrrhiza
Polypogon monspeliensis
Polystichum imbricans
Polystichum imbricans ssp. *imbricans*
Polystichum lemmonii
Polystichum munitum
Polystichum scopulinum
Populus fremontii
Populus tremuloides
Populus trichocarpa
Portulaca oleracea
Potamogeton amplifolius
Potamogeton crispus
Potamogeton natans
Potamogeton praelongus
Potentilla breweri
Potentilla drummondii
Potentilla flabellifolia
Potentilla gracilis
Potentilla gracilis var. *fastigiata*
Potentilla gracilis var. *gracilis*
Potentilla millefolia
Potentilla millefolia var. *klamathensis*
Primula hendersonii
Primula jeffreyi
Prosartes hookeri
Prosartes smithii
Prunella vulgaris
Prunella vulgaris var. *lanceolata*

Prunus emarginata
Prunus subcordata
Prunus virginiana
Pseudognaphalium thermale
Pseudoroegneria spicata
Pseudoroegneria spicata ssp. *inermis*
Pseudostellaria jamesiana
Pseudotrillium rivale
Pseudotsuga menziesii
Ptelea crenulata
Pteridium aquilinum
Pteridium aquilinum var. *pubescens*
Pterospora andromedea
Puccinellia distans
Puccinellia howellii
Puccinellia nuttalliana
Pulsatilla occidentalis
Purshia tridentata
Purshia tridentata var. *tridentata*
Pyrola aphylla
Pyrola asarifolia
Pyrola crypta
Pyrola dentata
Pyrola picta
Quercus berberidifolia
Quercus chrysolepis
Quercus chrysolepis var. *nana*
Quercus douglasii
Quercus durata
Quercus durata var. *durata*
Quercus garryana
Quercus garryana var. *breweri*
Quercus garryana var. *garryana*
Quercus kelloggii
Quercus lobata
Quercus x *moreha*
Quercus sadleriana
Quercus vacciniifolia
Quercus wislizeni
Quercus wislizeni var. *frutescens*
Quercus wislizeni var. *wislizeni*
Raillardella pringlei
Ranunculus alismifolius
Ranunculus alismifolius var. *alismellus*
Ranunculus aquatilis var. *aquatilis*
Ranunculus californicus
Ranunculus californicus var. *californicus*
Ranunculus gormanii
Ranunculus hebecarpus
Ranunculus occidentalis
Ranunculus occidentalis var. *occidentalis*
Ranunculus orthorhynchus var. *platyphyllus*
Ranunculus uncinatus
Rhamnus ilicifolia
Rhododendron columbianum
Rhododendron macrophyllum
Rhododendron occidentale
Rhus aromatica
Rhus trilobata
Ribes binominatum
Ribes bracteosum
Ribes inerme var. *klamathense*
Ribes lacustre
Ribes lobbii
Ribes marshallii
Ribes montigenum
Ribes nevadense
Ribes roezlii
Ribes roezlii var. *cruentum*
Ribes sanguineum
Ribes velutinum
Ribes viscosissimum
Rigiopappus leptocladus
Robinia pseudoacacia
Rorippa curvisiliqua
Rorippa palustris
Rosa californica
Rosa gymnocarpa
Rosa gymnocarpa var. *gymnocarpa*
Rosa pisocarpa
Rosa pisocarpa ssp. *pisocarpa*
Rosa rubiginosa
Rosa spithamea
Rubus armeniacus
Rubus laciniatus
Rubus lasiococcus
Rubus leucodermis
Rubus parviflorus
Rubus spectabilis

Rubus ursinus
Rudbeckia glaucescens
Rudbeckia klamathensis
Rumex acetosella
Rumex californicus
Rumex crispus
Rumex occidentalis
Sabulina cismontana
Sabulina douglasii
Sabulina nuttallii
Sabulina nuttallii var. *gracilis*
Sabulina nuttallii var. *gregaria*
Sabulina rosei
Sabulina rubella
Salix breweri
Salix delnortensis
Salix eastwoodiae
Salix exigua
Salix jepsonii
Salix laevigata
Salix lasiandra
Salix lasiandra var. *lasiandra*
Salix lasiolepis
Salix lemmonii
Salix melanopsis
Salix scouleriana
Salix sitchensis
Salvia sonomensis
Sambucus mexicana
Sambucus racemosa
Sanguisorba officinalis
Sanicula bipinnata
Sanicula bipinnatifida
Sanicula crassicaulis
Sanicula graveolens
Sanicula peckiana
Sanicula tuberosa
Saponaria officinalis
Sarcodes sanguinea
Saxifraga caespitosa
Saxifragopsis fragarioides
Schedonorus pratensis
Schoenoplectus acutus
Schoenoplectus acutus var. *occidentalis*
Schoenoplectus pungens var. *longispicatus*
Schoenoplectus subterminalis
Schoenoplectus tabernaemontani
Scirpus congdonii
Scirpus diffusus
Scirpus microcarpus
Scutellaria antirrhinoides
Scutellaria siphocampyloides
Sedum citrinum
Sedum flavidum
Sedum kiersteadiae
Sedum lanceolatum
Sedum laxum
Sedum laxum ssp. *laxum*
Sedum marmorense
Sedum oblanceolatum
Sedum obtusatum
Sedum oregonense
Sedum radiatum
Sedum spathulifolium
Selaginella scopulorum
Selaginella wallacei
Senecio aronicoides
Senecio integerrimus
Senecio integerrimus var. *major*
Senecio sylvaticus
Senecio triangularis
Sequoia sempervirens
Sericocarpus oregonensis
Sherardia arvensis
Sibbaldia procumbens
Sidalcea asprella
Sidalcea asprella ssp. *asprella*
Sidalcea oregana
Sidalcea oregana ssp. *oregana*
Sidalcea oregana ssp. *spicata*
Silene douglasii
Silene douglasii var. *douglasii*
Silene grayi
Silene greenei
Silene greenei ssp. *greenei*
Silene hookeri
Silene invisa
Silene laciniata

Silene laciniata ssp. *californica*
Silene lemmonii
Silene menziesii
Silene nelsonii
Sisyrinchium bellum
Sisyrinchium elmeri
Sisyrinchium idahoense
Smilax californica
Smilax jamesii
Solanum dulcamara
Solanum parishii
Solanum umbelliferum
Solidago elongata
Solidago multiradiata
Solidago spectabilis
Solidago velutina
Sonchus asper
Sorbus californica
Sorbus scopulina
Sorbus sitchensis
Sorbus sitchensis var. *sitchensis*
Sparganium angustifolium
Sparganium eurycarpum
Sparganium natans
Spartium junceum
Spergularia marina
Spergularia rubra
Spiraea densiflora
Spiraea douglasii
Spiraea splendens
Spiranthes porrifolia
Stachys ajugoides
Stachys rigida
Stachys rigida var. *quercetorum*
Stachys rigida var. *rigida*
Stellaria crispa
Stellaria longipes
Stellaria longipes ssp. *longipes*
Stellaria media
Stellaria umbellata
Stephanomeria virgata
Stephanomeria virgata ssp. *pleurocarpa*
Stipa stillmanii
Stipa thurberiana
Streptanthus barbatus
Streptanthus tortuosus
Streptopus amplexifolius
Streptopus amplexifolius ssp. *americanus*
Struthiopteris spicant
Styrax redivivus
Symphoricarpos albus
Symphoricarpos albus var. *laevigatus*
Symphoricarpos mollis
Symphoricarpos rotundifolius
Symphyotrichum foliaceum
Symphyotrichum foliaceum var. *apricum*
Symphyotrichum foliaceum var. *parryi*
Symphyotrichum spathulatum
Symphyotrichum spathulatum var. *intermedium*
Symphyotrichum spathulatum var. *spathulatum*
Taeniatherum caput-medusae
Taraxacum erythrospermum
Taraxacum officinale
Tauschia glauca
Taxus brevifolia
Tellima grandiflora
Thalictrum fendleri
Thelypodium brachycarpum
Thermopsis gracilis
Thinopyrum intermedium
Thysanocarpus curvipes
Tiarella trifoliata var. *unifoliata*
Tolmiea diplomenziesii
Tonella tenella
Torilis arvensis
Torreyochloa pallida
Toxicodendron diversilobum
Toxicoscordion micranthum
Toxicoscordion paniculatum
Toxicoscordion venenosum
Tragopogon dubius
Trautvetteria caroliniensis
Triantha occidentalis
Triantha occidentalis ssp. *occidentalis*
Trichostema laxum
Trifolium albopurpureum
Trifolium arvense
Trifolium bifidum

Trifolium breweri
Trifolium ciliolatum
Trifolium cyathiferum
Trifolium dichotomum
Trifolium dubium
Trifolium eriocephalum
Trifolium fragiferum
Trifolium glomeratum
Trifolium hirtum
Trifolium hybridum
Trifolium longipes
Trifolium longipes ssp. *elmeri*
Trifolium longipes ssp. *hansenii*
Trifolium longipes ssp. *shastense*
Trifolium oliganthum
Trifolium productum
Trifolium repens
Trifolium subterraneum
Trifolium variegatum
Trifolium willdenovii
Triglochin concinna var. *debilis*
Triglochin maritima
Trillium albidum
Trillium chloropetalum
Trillium kurabayashii
Trillium ovatum
Trillium ovatum ssp. *oettingeri*
Trillium ovatum ssp. *ovatum*
Trisetum canescens
Trisetum spicatum
Triteleia bridgesii
Triteleia crocea var. *modesta*
Triteleia hyacinthina
Triteleia ixioides
Tsuga heterophylla
Tsuga mertensiana
Turritis glabra
Typha latifolia
Umbellularia californica
Uropappus lindleyi
Urtica dioica
Utricularia macrorhiza
Utricularia minor
Utricularia occidentalis
Vaccinium cespitosum
Vaccinium deliciosum
Vaccinium membranaceum
Vaccinium ovatum
Vaccinium parvifolium
Vaccinium scoparium
Vaccinium uliginosum
Valeriana sitchensis
Vancouveria chrysantha
Vancouveria hexandra
Vancouveria planipetala
Ventenata dubia
Veratrum californicum
Veratrum californicum var. *californicum*
Veratrum insolitum
Veratrum viride
Verbascum blattaria
Verbascum thapsus
Verbena lasiostachys
Veronica americana
Veronica anagallis-aquatica
Veronica catenata
Veronica copelandii
Veronica serpyllifolia
Vicia americana
Vicia americana ssp. *americana*
Vicia sativa
Vicia sativa var. *nigra*
Vicia villosa ssp. *villosa*
Vinca major
Viola adunca
Viola adunca var. *adunca*
Viola cuneata
Viola glabella
Viola hallii
Viola lobata
Viola lobata ssp. *integrifolia*
Viola lobata ssp. *lobata*
Viola macloskeyi
Viola nephrophylla
Viola ocellata
Viola primulifolia ssp. *occidentalis*
Viola purpurea
Viola purpurea ssp. *purpurea*
Viola sempervirens
Viola sheltonii

Vitis californica
Vulpia microstachys
Vulpia myuros
Whipplea modesta
Woodwardia fimbriata
Wyethia glabra
Wyethia helenioides
Wyethia longicaulis
Xanthium strumarium
Xerophyllum tenax

APPENDIX D: KLAMATH MOUNTAINS PROJECT HERBARIUM SPECIMEN INFORMATION

List of plant species and number of voucher specimens collected for the Klamath Mountains Vegetation Classification project between 2023 – 2025. Vouchers have been identified and deposited in the California Polytechnic State University, Humboldt Herbarium. A second column is provided for collections that were deposited at the Ahart Herbarium at California State University, Chico. Species with a California Rare Plant Rank are indicated by * following the scientific name.

Species	Humboldt Collections	Chico Collections
Acer glabrum	1	
Acer glabrum var. *glabrum*	1	
Acmispon parviflorus	1	
Aconitum columbianum ssp. *columbianum*	1	
Adiantum aleuticum	1	
Agoseris heterophylla var. *heterophylla*	1	
Agrostis exarata	2	
Agrostis gigantea	1	
Agrostis pallens	3	
Agrostis variabilis	1	
Allium acuminatum	1	
Allium falcifolium	1	
Allium membranaceum	1	
Amauropelta nevadensis	1	
Anemone drummondii	1	
Angelica tomentosa	3	
Anisocarpus madioides	1	
Antennaria media	1	
Arctostaphylos manzanita ssp. *manzanita*	1	
Arctostaphylos nevadensis	1	
Arctostaphylos patula	3	
Arctostaphylos viscida ssp. *viscida*	1	
Arnica discoidea	1	
Artemisia borealis	1	

Species	Humboldt Collections	Chico Collections
Asarum hartwegii	1	
Astragalus whitneyi var. *siskiyouense*	1	
Astragalus californicus	1	
Balsamorrhiza deltoidea	1	
Boechera pinetorum	1	
Boechera praticola	1	
Boykinia occidentalis	1	
Bromus diandrus	1	
Bromus hordeaceus	2	
Bromus laevipes	2	
Bromus sitchensis	1	
Bromus sitchensis var. *carinatus*	1	
Bromus suksdorfii	3	
Cacaliopsis nardosmia	1	
Calamagrostis koelerioides	4	
Calamagrostis purpurascens	1	
Calamagrostis stricta ssp. *inexpansa*	1	
Calliscirpus criniger	3	
Calochortus elegans	2	
Calochortus tolmiei	1	
Caltha leptosepala	2	
Calycanthus occidentalis	1	
Calyptridium monospermum	1	
Cardamine occidentalis	1	
Carex amplifolia	1	
Carex angustata	3	
Carex aquatilis var. *aquatilis*	1	
Carex brainerdii	2	
Carex breweri	1	
Carex buxbaumii	2	
Carex densa	1	
Carex echinata	1	
Carex exsiccata	2	
Carex feta	2	
*Carex geyeri**	3	

Species	Humboldt Collections	Chico Collections
Carex harfordii	1	
Carex hassei	2	
Carex hoodii	3	
Carex inops ssp. *inops*	1	
Carex integra	1	
Carex klamathensis	1	
Carex leptopoda	2	
Carex luzulina	10	
Carex mendocinensis	5	
Carex multicaulis	1	
Carex multicostata	1	
Carex nigricans	1	
Carex nudata	4	
Carex neurophora	1	
Carex pellita	1	
Carex preslii	1	
Carex rossii	1	
*Carex scabriuscula**	9	1
Carex scopulorum var. *bracteosa*	2	
Carex serratodens	1	
Carex simulata	1	
Carex subfusca	1	
Carex utriculata	3	
Carex vernacula	1	
Carex vesicaria	1	
Castilleja affinis	1	
Castilleja applegatei ssp. *pinetorum*	2	
Castilleja arachnoidea	1	
Castilleja miniata ssp. *miniata*	2	
Ceanothus integerrimus	1	
Ceanothus cuneatus	2	
Ceanothus cuneatus var. *cuneatus*	1	
Cerastium arvense	1	
Cerastium arvense ssp. *strictum*	1	
Cercocarpus betuloides var. *macrourus*	1	

Species	Humboldt Collections	Chico Collections
Cercocarpus betuloides var. *betuloides*	1	
Chimaphila menziesii	1	
Chimaphila umbellata	1	
Cirsium douglasii var. *breweri*	2	
Cirsium occidentale	1	
Clarkia heterandra	1	
Clarkia purpurea ssp. *quadrivulnera*	1	
Claytonia rubra ssp. *depressa*	1	
Clintonia uniflora	1	
Collinsia linearis	1	
Collomia grandiflora	1	
Collomia heterophylla	2	
Comandra umbellatum ssp. *californica*	1	
Cornus sericea	2	
Crepis acuminata	3	
Crepis occidentalis ssp. *conjuncta*	1	
Cryptantha milobakeri	1	
Cuscuta occidentalis	3	
*Cypripedium californicum**	1	
Danthonia californica	1	
Danthonia intermedia	2	
Danthonia intermedia ssp. *intermedia*	2	
Danthonia unispicata	2	
*Darlingtonia californica**		2
Darmera peltata	1	
Dasiphora fruticosa	3	
Delphinium nuttallianum	1	
Delphinium decorum ssp. *tracyi*	2	
Deschampsia cespitosa	2	
Deschampsia cespitosa ssp. *cespitosa*	2	
Deschampsia elongata	1	
Dicentra formosa	2	
Dichelostemma multiflorum	1	
Diplacus leptaleus	1	
Diplacus mephiticus	1	

Species	Humboldt Collections	Chico Collections
Downingia pulcherrima	1	
Draperia systyla	1	
Drymocallis glandulosa var. *glandulosa*	1	
Dulichium arundinaceum var. *arundinaceum*	1	
Eleocharis decumbens	8	
Eleocharis macrostachya	3	
Eleocharis palustris	1	
Eleocharis parishii	5	
Elymus elymoides var. *californicus*	2	
Elymus glaucus	2	
Elymus glaucus ssp. *glaucus*	1	
Elymus trachycaulus	1	
Elymus trachycaulus ssp. *trachycaulus*	5	
Epilobium ciliatum	1	
Epilobium minutum	2	
Epilobium pallidum	1	
Eremogone congesta	1	
*Eriastrum tracyi**	1	
Ericameria greenei		1
Ericameria nauseosa	1	
Erigeron aliceae	1	
Erigeron glacialis var. *glacialis*	1	
Erigeron lassenianus var. *lassenianus*	1	
Erigeron petrophilus var. *viscidulus**	1	
Erigeron pumilus var. *intermedius*	1	
Eriodictyon californicum	2	
Eriodictyon lobbii	1	
*Eriogonum alpinum**		1
*Eriogonum congdonii**	2	
Eriogonum nudum	1	
*Eriogonum siskiyouense**	2	1
Eriogonum strictum var. *greenei**	1	
Eriogonum umbellatum		1
Eriogonum umbellatum var. *goodmanii*	1	
Eriogonum umbellatum var. *dumosum*	1	

Species	Humboldt Collections	Chico Collections
Eriogonum umbellatum var. *humistratum**	1	1
Eriogonum ursinum var. *erubescens**	1	
Eriogonum vimineum	1	
Eriophorum crinigerum	2	
Eriophyllum lanatum	1	
Eriophyllum lanatum var. *grandiflorum*	1	
Erythranthe guttata	4	
Erythranthe linearifolia	3	
Erythranthe microphylla	3	1
Erythranthe primuloides	1	1
Erythronium grandiflorum	1	
Eschscholzia californica	1	
Festuca elmeri	1	
Festuca idahoensis	2	
Festuca occidentalis	3	
Festuca roemeri var. *klamathensis*	1	
Festuca subulata	1	
Festuca viridula	1	
Frangula californica ssp. *occidentalis*	1	
Fritillaria atropurpurea	1	
Galium ambiguum ssp. *ambiguum*	2	
Galium glabrescens	1	
Galium triflorum	1	
Gallium serpenticum ssp. *scotticum**	1	1
Garrya flavescens	1	
Garrya fremontii	1	
Gentiana calycosa	1	
Gentiana newberryi var. *newberryi*		1
Gentianella amarella ssp. *acuta*		1
Gilia capitata ssp. *capitata*	1	
Gilia capitata ssp. *pacifica**	1	
Hackelia setosa	1	
Hastingsia alba	2	
Hieracium albiflorum	1	
Helenium bigelovii	1	

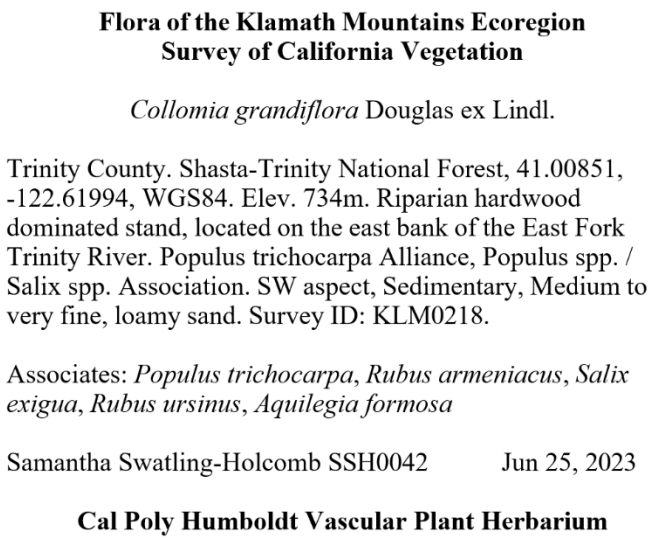
Species	Humboldt Collections	Chico Collections
Heuchera micrantha	1	
Hieracium nudicaule	1	
Holodiscus discolor var. *glabrescens*	1	
Hosackia oblongifolia	1	
Hosackia oblongifolia ssp. *oblongifolia*	1	
*Howellanthus dalesianus**		2
Hydrocotyle verticillata	1	
Ipomopsis aggregata	1	
Ipomopsis congesta ssp. *montana*	1	
Iris macrosiphon	1	
Iris tenuissima ssp. *tenuissima*	2	
Ivesia gordonii	1	
Juncus acuminatus	1	
Juncus balticus ssp. *ater*	2	
Juncus confusus	4	
Juncus ensifolius	3	
Juncus howellii	7	
Juncus mertensianus	1	
Juncus nevadensis var. *nevadensis*	6	
Juncus parryi	1	
Koeleria macrantha	1	
Kyhosia bolanderi	1	
Lathyrus polyphyllus	1	
Leucothoe davisiae	1	
Lewisia leeana	1	
Ligusticum grayi	1	
Lilium pardalinum ssp. *shastense*	2	
Linnaea borealis	1	
Lolium perenne ssp. *multiflorum*	1	
*Lomatium engelmannii**	2	
Lupinus albicaulis	1	
Lupinus croceus	2	
Lysimachia latifolia	3	
Madia exigua	1	
Madia gracilis	2	

Species	Humboldt Collections	Chico Collections
Maianthemum racemosum	1	
Melica californica	1	
Melica harfordii	3	
*Micranthes marshallii**	1	
Montia parviflora	1	
Muhlenbergia andina	3	
Muhlenbergia filiformis	5	1
Navarretia linearifolia ssp. *linearifolia*	1	
Navarretia sinistra ssp. *sinistra*	1	
Nemophila parviflora ssp. *austiniae*	1	
Noccaea fendleri	1	
Oreostemma alpigenum var. *andersonii*	1	
Orthocarpus cuspidatus ssp. *copelandii*	4	
Osmorhiza berteroi	2	
Ozomelis trifida	1	
*Packera macounii**	1	
Parnassia cirrata var. *intermedia**		1
Pectiantia pentandra	1	
Pedicularis attollens	2	
Penstemon davidsonii	1	
Penstemon newberryi	2	
Penstemon newberryi var. *berryi*	1	
Penstemon parvulus	1	
Penstemon procerus var. *formosus*	1	
Penstemon rupicola	1	
Penstemon speciosus	1	
Perideridia bolanderi ssp. *bolanderi*	1	
Perideridia oregana	1	
Perideridia parishii	1	
Perideridia parishii ssp. *latifolia*	4	
Phacelia hastata ssp. *hastata*	1	
Phalaris minor	1	
Phleum alpinum	1	
Phlox diffusa	1	
Phyllodoce empetriformis	1	

Species	Humboldt Collections	Chico Collections
Platanthera dilatata	1	
Platanthera sparsiflora	1	
Poa cusickii ssp. *cusickii*	1	
Poa cusickii ssp. *epilis*	1	
Poa cusickii ssp. *purpurascens*	2	
*Poa piperi**	1	
Poa pratensis ssp. *pratensis*	1	
Poa secunda	2	
Poa secunda ssp. *secunda*	4	
Poa wheeleri	1	
Podagrostis thurberiana	1	
Polygonum douglasii	1	
Polygonum polygaloides spp. *kelloggii*	1	
Potamogeton natans	2	
*Potamogeton praelongus**		1
Potentilla breweri	1	
Potentilla flabellifolia	2	
Potentilla gracilis var. *fastigiata*	2	
Primula jeffreyi	1	
Prunus emarginata	2	
Pseudoroegneria spicata	2	
Puccinellia distans	1	
Pulsatilla occidentalis	2	
Pyrola aphylla	1	
Pyrola picta	1	
Quercus durata var. *durata*	1	
Quercus garryana var. *garryana*	1	
*Raillardella pringlei**	2	2
Ranunculus hebecarpus	1	
Rhamnus ilicifolia	1	
Rhododendron columbianum	1	
Rhus aromatica	1	
Ribes binominatum	1	
Ribes nevadense	1	
Rorippa curvisiliqua	1	

Species	Humboldt Collections	Chico Collections
Rosa gymnocarpa ssp. *gymnocarpa*	1	
Rosa pisocarpa ssp. *pisocarpa*	1	
Rubus parviflorus	1	
Rudbeckia klamathensis	2	
Sabulina douglasii	1	
Sabulina nuttallii var. *gregaria*	1	
*Sabulina rosei**	1	
Salix breweri	1	
*Salix delnortensis**	1	
Salix eastwoodiae	3	
Salix jepsonii	1	
Salix lasiolepis	2	
Salix scouleriana	1	
Sambucus racemosa	1	
Sanicula bipinnatifida	2	
Schoenoplectus acutus var. *occidentalis*	1	
*Schoenoplectus subterminalis**		1
Schoenoplectus tabernaemontani	1	
Scirpus congdonii	2	
Sedum laxum	1	
Sedum radiatum	1	
Senecio triangularis	2	
Sidalcea oregana	1	
Sidalcea oregana ssp. *spicata*	1	
Silene douglasii var. *douglasii*	1	
Silene laciniata ssp. *californica*	1	
Silene lemmonii	1	
Silene nelsonii	2	
Smilax jamesii	1	
Sorbus sitchensis var. *sitchensis*	1	
Sparganium angustifolium	2	
Spiraea douglasii	2	
Spiraea splendens	2	
Stellaria longipes ssp. *longipes*	1	
Stipa lemmonii var. *lemmonii*	3	

Species	Humboldt Collections	Chico Collections
Stipa occidentalis	1	
Stipa stillmanii	1	
Symphyotrichum spathulatum var. *spathulatum*	2	
Tolmiea diplomenziesii	1	
Tolmiea menziesii	1	
Torreyochloa pallida	1	
Toxicoscordion venenosum var. *venenosum*	1	
Triantha occidentalis	1	
Triantha occidentalis ssp. *occidentalis*	1	
Trifolium breweri	1	
Trifolium fragiferum	1	
Trifolium hirtum	1	
Trifolium longipes ssp. *elmeri*	1	
Trifolium oliganthum	1	
Trifolium productum	1	
Triteleia hyacinthina	1	
*Utricularia minor**		2
Vaccinium membranaceum	1	
*Vaccinium scoparium**	2	
Vancouveria planipetala	2	
*Veronica copelandii**	1	
Viola cuneata	1	
Viola hallii	1	
Vicia americana	1	
Vitis californica	1	
*Wyethia longicaulis**	1	



Flora of the Klamath Mountains Ecoregion
Survey of California Vegetation

Collomia grandiflora Douglas ex Lindl.

Trinity County. Shasta-Trinity National Forest, 41.00851, -122.61994, WGS84. Elev. 734m. Riparian hardwood dominated stand, located on the east bank of the East Fork Trinity River. Populus trichocarpa Alliance, Populus spp. / Salix spp. Association. SW aspect, Sedimentary, Medium to very fine, loamy sand. Survey ID: KLM0218.

Associates: *Populus trichocarpa*, *Rubus armeniacus*, *Salix exigua*, *Rubus ursinus*, *Aquilegia formosa*

Samantha Swatling-Holcomb SSH0042 Jun 25, 2023

Cal Poly Humboldt Vascular Plant Herbarium

Figure 11. Example of a standard herbarium label for specimens deposited to the California Polytechnic State University, Humboldt herbarium from the Klamath Mountains Vegetation Sampling project.

APPENDIX E: PHOTOS OF POTENTIALLY NEW VEGETATION TYPES



Stand of *Anemone drummondii* with subdominant *Silene grayii* on Seven Up Peak, Shasta-Trinity NF (KLM2177, 7/29/2024).



Stand of *Angelica tomentosa* near Swift Creek, Shasta-Trinity NF (KLM0988, 7/28/2024).



Stand of *Carex hoodii* near Swift Creek, Shasta-Trinity NF (KLM0430, 7/27/2024).



Stand of *Elymus trachycaulus* with subdominant *Muhlenbergia filiformis* in Parker Meadow, Shasta-Trinity NF (KLM0423, 7/25/2024).



Stand of *Eriogonum siskiyouense* with codominant *Phlox diffusa* along the Chanchelulla Divide, Shasta-Trinity NF (KLM0485, 6/28/2025).



Stand of *Hastingsia alba* near Bear Creek, Shasta-Trinity NF (KLM2761, 7/10/2025).



Stand of *Hastingsia serpentinicola* near Middle Fork Beegum Creek, Shasta-Trinity NF (KLM2939, 6/28/2025).



Stand of *Ivesia gordonii* along Long Canyon Trail, Shasta-Trinity NF (KLM3113, 7/14/2025)



Stand of *Ligusticum grayii* with codominant *Carex luzulina* along Ward Lake Trail, Shasta-Trinity NF (KLM2171, 7/28/2024).



Stand of *Lomatium californicum* with subdominant *Monardella odoratissima* near Ash Creek, Klamath NF (KLM0312, 5/6/2024).



Stand of *Phlox diffusa* with subdominant *Eremogone congesta* at Toad Lake, Shasta-Trinity NF (KLM0861, 8/14/2023).



Stand of *Rudbeckia klamathensis* near Gumboot Trailhead, Shasta-Trinity NF (KLM2972, 7/24/2025).