GUIDELINES FOR CREATING A VEGETATION REPORT

What Is This Document?

This is an informational document for creating vegetation classification and mapping reports that meet Survey of California Vegetation (SCV) standards while maintaining Americans with Disabilities Act (ADA) compliance. For more information on SCV standards, please refer to the Survey of California Mapping and Classification Standards.

Below, the document is broken up into headings based on an outline of required SCV deliverables. In general, this document supplies a structure for reports that addresses the heading titles and desired content. A blank template is available alongside this instructional document containing the preset headings and structure with no added information.

Specific guides for maintaining ADA compliance as it relates to vegetation reports are included in the appendices of this document. In general, use size 12 or larger Arial font and be sure all non-text objects have descriptive text associated with them, either in the form of detailed captions or alt text. For detailed information about ADA formatting, please visit the World Wide Web Consortium's Web Content Accessibility Guidelines website.

Some reports may cover only portions of a complete mapping project (for instance, an Accuracy Assessment Report), so only the applicable sections shown in this document would be included.

Information listed in each section of the body includes all the information typically generated for a report. Some of these items should be presented as an appendix rather than in the body of the report. See Appendix A for a list of usual appendices.

For examples of different report organizational structures, please refer to following reports in the VegCAMP document library. Note: these examples may not be ADA compliant.

- California Desert Vegetation Map and Accuracy Assessment in Support of the Desert Renewable Energy Conservation Plan 2013
- Classification and Mapping of Mendocino Cypress (*Hesperocyparis pygmaea*) Woodland and Related Vegetation on Oligotrophic Soils, Mendocino and Sonoma Counties, California 2019
- Fine-Scale Vegetation Map of a Portion of Modoc and Lassen Counties, California, for the Bureau of Land Management (Applegate Field Office) 2021

Title Page

Example of a title page photo (note the use of alt text: right click to View AltText):

The following information should be included on the title page*:

- Date
- Preparer(s)
- Agency for which the report was prepared
- Contract number, if applicable

*VegCAMP information is shown below as an example.

California Department of Fish and Wildlife

Biogeographic Data Branch

Vegetation Classification and Mapping Program

2021

CONTENTS

- Insert a table of contents for the main body of the report, tables of figures, charts, etc. and a table of appendices.
- Appropriate use of headings throughout the report is required and will make these tables easier to generate.

*Color Coding

Sampling reporting. To be included in a classification report if there is an analysis happing in conjunction with the project. If there isn't a classification analysis happening, then a sampling specific report will be produced to include these things.

Classification report. Will include the sampling reporting items. This will likely include sampling efforts completed from multiple projects (although there might be a main effort). If a contractor completed sampling component, we would ask them to contribute to those sections.

Mapping report: should reference the vegetation classification report/key and sampling effort used to inform/attribute mapping. Could include the key as an appendix.

FIGURES

TABLES

APPENDICES

ABSTRACT

The abstract should briefly but concisely identify the objectives, methods, principal results, and major conclusions. The purpose is to allow readers to determine whether the information is useful to them. The recommended length is up to 3% of the total length of the report, with a maximum length of 250 words.

ACKNOWLEDGEMENTS

In this section, acknowledge:

- Funder(s)
- Landowner access contacts
- Data contributors
- Staff

INTRODUCTION

- Use a subheading for each of the following sections used in the introduction:
    - Purpose, scope, study area, context, etc.
- Map delineating the study area. Follow formatting example in Appendix C.

METHODS

FIELD SAMPLING

Sample Allocation

- Details about the sample allocation process

Data Collection

- (Reconnaissance, Rapid Assessment (RA)/Relevé)
- Map of study area showing the surveyed data points
    - Follow map formatting guidelines in Appendix C.
- Taxonomy standard
    - e.g., Jepson E-Flora for identification of plants, USDA NRCS PLANTS codes incorporated into standard databases where possible

DIGITAL DATA ENTRY METHODS AND FIELD SURVEY DATABASE DESCRIPTION

- Database quality control

CLASSIFICATION

- Description of analysis, software used, and steps performed
    - Cover class categories used for analysis
    - Identification of plots and species removed (if any) as outliers and the criteria for their removal
    - For hierarchical clustering, report distance measure and linkage method used
- Description of approach to developing classification
- General approach to developing the key
- Description of the field test of the key
- Approach to summarizing environmental data for each vegetation type
- Approach to summarizing species data for each vegetation type
- Definitions of terms used in descriptions and keys (should be included in the intro text to the key and included as an appendix)

MAPPING

Mapping Materials

- Computer software/hardware
- Imagery and data layers used

Map Classification

- Adapting the vegetation classification to the map classification
- USNVC hierarchy level at which vegetation types were mapped
- Vegetation types that were not mappable
- Use of field data assisting photo-interpretation or modeling
- Ancillary data (geology, topography, hydrology, etc.), and base and ancillary imagery used for the map

Mapping Reconnaissance

- Field survey dates, with area surveyed

Mapping Methods and Criteria

- Delineation and attribution methods
- Minimum mapping units (MMUs) for vegetation type changes and cover breaks
- Minimum width of linear polygons
- Full descriptions of each map attribute (may be listed here or in an appendix)
- Description of mapping geodatabase and quality control methods

ACCURACY ASSESSMENT

Sample Allocation

- Details about the AA sample allocation process

Field Sampling

- Map depicting locations of surveyed AA points
- Measures to ensure the independence of field samplers, AA scorers, and mappers
- Scoring method and goodness-of-fit scoring rules
- Process for providing feedback to mappers and correcting the map

RESULTS

SAMPLING

Floristics

- Total number of species encountered in project
- List of species used in the analysis, with codes (may be listed here or in an appendix). Follow table template guidelines provided in Appendix A.
- List of rare species, their rarity ranking, and the vegetation types in which they were found. Follow table template guidelines provided in Appendix A.
- Location of and number of voucher specimens collected (list any rare species documented with vouchers)

Sample Collection

- Number and type (RA, Relevé, Reconnaissance) of samples collected for each vegetation type
- Accuracy of field survey database, if tested

ANALYSIS

- Table with all plant taxa and corresponding survey ID's and cover categories imported into analysis software. Follow formatting instructions for tables in Appendix A.
- For indicator species analysis, report cluster groupings with relatively low p-values and high numbers of indicator species
- Table identifying final cluster groupings and all survey IDs included in each group. Follow formatting instructions for tables in Appendix A.

CLASSIFICATION

- Table showing relationship of final vegetation types in the classification to USNVC hierarchy standards, with sample sizes for each type sampled at the finest hierarchical level (e.g., at Alliance, Association level). Follow formatting instructions for tables in Appendix A.
- Table showing final classification names for each field survey (some may be unclassifiable), and number and ranges of classes. Follow table formatting guidelines in Appendix A.
- Vegetation key: describe here and include as an appendix
- Vegetation type descriptions: describe here and include as an appendix. See formatting guidelines in Appendix D.
    - Summary

    - Distribution in project area and global distribution
    - Environmental description
    - Comments
    - Total number of samples of this type in the project area, and list of field survey database IDs for all samples
    - Rarity status
    - Stand tables: table summarizing constancy and abundance values for taxa in each vegetation type (for abundance, include minimum, maximum and average values for each taxon). Optional categories can include indicator, exotic, or special status species notation. Follow formatting instructions for tables in Appendix A.
- Crosswalk to other vegetation classifications: describe here and include as an appendix. If utilizing a table for crosswalk, be sure to follow formatting instructions for tables in Appendix A.

MAPPING

Summary Statistics

- Total number of polygons, average polygon size
- Number of polygons and acreage mapped for each vegetation type
- Common and uncommon vegetation types
- Detailed description of all map classes and their identification, with examples over imagery. Follow formatting guidelines for images in Appendix B. An example of a map class description can be found in Appendix D.

ACCURACY ASSESSMENT (AA)

Sample Allocation Results

- Number of AA surveys of each vegetation type mapped

Summary Statistics

- Contingency table (confusion matrix): describe here and include as an appendix. Follow formatting guidelines for the Confusion Matrix Table in Appendix A.
- Table of results showing vegetation type, and users' and producers' accuracy. Follow formatting guidelines for table in Appendix A.
- Discussion of types that did not achieve 80% accuracy
    - Potential reasons for confusion
    - Possible remedies to improve accuracy

- Actions taken to correct the map

LITERATURE CITED

Citation examples:

CNPS. 2020. A Manual of California Vegetation, Online Edition. http://www.cnps.org/cnps/vegetation/. California Native Plant Society, Sacramento, CA.

Jepson Flora Project (eds.) 2015. *Jepson eFlora*, http://ucjeps.berkeley.edu/eflora/ accessed various dates in March 2015.

Sawyer, J. O., T. Keeler-Wolf, and J. Evens. 2009. A manual of California vegetation. Second edition. California Native Plant Society, Sacramento CA. 1300 pp.

USDA NRCS. 2015. The PLANTS Database (http://plants.usda.gov, 4 June 2015). National Plant Data Team, US Department of Agriculture, Natural Resources Conservation Service, Greensboro, NC 27401-4901 USA.

APPENDIX A: TYPICAL INFORMATION INCLUDED IN APPENDICES

The appendices in this instructional template document show examples and instructions to aid in report creation and are not intended to be included in actual reports. Any appendices here that are representative of actual report appendices may be organized differently.

Below is a list of items that would typically be included as appendices rather than in the body of a report:

- Final Vegetation Classification and Hierarchy
- Vegetation Key
- Field Forms and Protocols
- Initials used on Field Survey Forms
- Plant Taxa List
- Cluster Analysis Dendrogram
- Noteworthy Taxa
- Classification Crosswalk
- Accuracy Assessment Tables
- Vegetation Type Descriptions
    - Usually included in a classification report
- Map Class Descriptions
    - Usually included in a mapping report
- Glossary of Terms

APPENDIX B: ADA TABLE EXAMPLES

- Rules for formatting tables for ADA compliance:
  - Tabs, Tables, Columns in Word
  - Tables should be simple and easy to navigate, with no merged or split cells, and headings repeated across pages.
  - Tables wider than 63 columns (example: contingency tables) do not fit in word. In this case, the table should be stored externally and shown as a linked image in the report.

TABLE 1: EXAMPLE OF A SIMPLE TABLE: ACCURACY ASSESSMENT. USERS' AND PRODUCERS' ACCURACY BY TYPE.

Map Class	Users' Accuracy	Users' Count	Producers' Accuracy	Producers' Count
Abies concolor – Pinus ponderosa / Cercocarpus ledifolius Association	93.3	9	82.2	9
Populus tremuloides / Symphoricarpos rotundifolius Association	100.0	15	100.0	16
Juniperus occidentalis – Pinus jeffreyi / (Purshia tridentata, Prunus virginiana) Association	62.5	8	97.5	8
Juniperus occidentalis / Artemisia arbuscula / Poa secunda Association	91.1	18	96.9	13
Juniperus occidentalis / Artemisia tridentata – Purshia tridentata Association	97.0	27	98.8	17
Juniperus occidentalis / Cercocarpus ledifolius Association	84.0	5	100.0	7
Cercocarpus ledifolius – Artemisia tridentata ssp. vaseyana Association	100.0	9	100.0	6
Cercocarpus ledifolius – Prunus virginiana – Symphoricarpos rotundifolius Scrub Association	97.5	8	90.0	12
Bromus tectorum Ruderal Grassland Association	74.0	10	84.2	19
Ericameria nauseosa Shrubland Association	96.7	6	78.3	12
Ericameria nauseosa / Bromus tectorum Ruderal Shrubland Association	75.0	12	78.0	10

Map Class	Users' Accuracy	Users' Count	Producers' Accuracy	Producers' Count
Artemisia arbuscula / Poa secunda Association	73.3	24	92.9	17
Artemisia arbuscula / Bromus tectorum Ruderal Shrubland Association	77.5	16	93.3	6
Artemisia nova / Poa secunda Association	84.0	5	88.0	5
Eriogonum sphaerocephalum / Poa secunda Dwarf-shrub Grassland Association	86.0	10	100.0	7
Artemisia tridentata – Ephedra spp. Shrubland Association	92.9	14	94.5	11
Artemisia tridentata Shrubland Association	93.3	9	95.0	12
Artemisia tridentata – (Ericameria nauseosa) / Bromus tectorum Ruderal Shrubland Association	82.7	15	85.7	7
Artemisia tridentata ssp. vaseyana – Symphoricarpos oreophilus / Bromus carinatus Shrubland Association	84.0	10	100.0	8
Artemisia tridentata ssp. vaseyana / Festuca idahoensis Shrub Grassland Association	97.1	7	97.1	7
Purshia tridentata – Artemisia tridentata Association	78.8	16	90.9	11
Purshia tridentata – Artemisia tridentata – Tetradymia canescens Association	90.0	8	89.1	11
Tetradymia canescens Provisional Association	84.7	17	90.9	11
Ceanothus velutinus Shrubland Association	87.8	18	97.5	16
Prunus emarginata Sierran Chaparral Shrubland Association	62.9	7	52.9	14
Salix lasiolepis – Rosa woodsii / Mixed Herbs Wet Shrubland Association	93.3	6	90.0	6
Artemisia cana (ssp. bolanderi, ssp. viscidula) / Poa secunda Wet Shrubland Association	80.0	14	81.5	13

Map Class	Users' Accuracy	Users' Count	Producers' Accuracy	Producers' Count
Prunus virginiana / Leymus cinereus Shrubland Association	84.4	9	71.4	14
Vancouverian – Rocky Mountain Montane Wet Meadow & Marsh Group	100.0	6	80.0	8
Juncus balticus Wet Meadow Association	95.0	16	86.3	19
Taraxia tanacetifolia – Iva axillaris Provisional Association	95.0	8	100.0	9
Sarcobatus vermiculatus – Artemisia tridentata Wet Shrubland Association	90.0	20	84.8	21
Elymus cinereus Bottomland Wet Meadow Association	65.5	11	49.3	15
Columbia Plateau cliff, scree and rock mapping unit	100.0	7	86.7	9
Overall Score	86.7	N/A	88.4	N/A

TABLE 2: EXAMPLE OF A LINKED CONTINGENCY TABLE

An image of the table can be inserted in the report here with a link to an excel version will be posted on the CDFW document library. Please provide a Table.xlsx version of the contingency table separately. Be sure to make it clear that the image contains a link to an external copy of the contingency table. Also note that alt text should be included if there is not a caption.

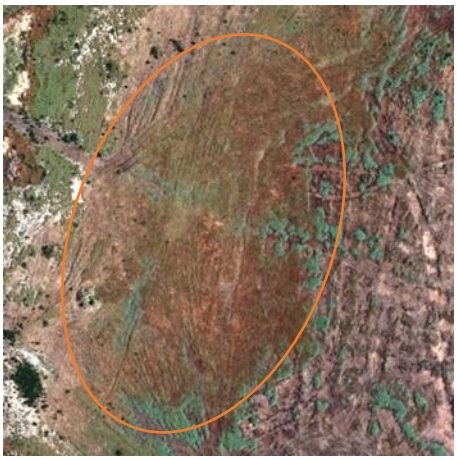
Field Assessed Type

Map Code	Mapped Type	Forest and Woodland Class	Abies concolor Alliance	Populus tremuloides Alliance	Central Rocky Mountain Ponderosa Pine Open Woodland Group	Pinus ponderosa / Shrub Understory Alliance	Juniperus occidentalis Alliance	Cercocarpus ledifolius Alliance	Ericameria nauseosa Alliance	Bromus tectorum - Elymus caput-medusae Alliance	Artemisia arbuscula Alliance	Artemisia nova Alliance	Eriogonum spp. / Poa secunda Alliance	Artemisia tridentata Alliance	Artemisia tridentata ssp. vaseyana Alliance	Purshia tridentata - Artemisia tridentata Alliance	Chrysothamnus viscidiflorus Alliance	Western North American Montane Scrub Group	Ceanothus velutinus Alliance	Prunus emarginata - Holodiscus discolor Alliance	Arctostaphylos patula - Arctostaphylos nevadensis Alliance	Festuca idahoensis - Pseudoroegneria spicata - Poa secunda Alliance	Elymus smithii Unique Stands	Artemisia cana Alliance	Salix exigua Alliance	Prunus virginiana Alliance	Vancouverian - Rocky Mountain Montane Wet Meadow and Marsh Group	Danthonia californica – Deschampsia cespitosa – Camassia quamash Alliance	Juncus balticus - Juncus mexicanus Alliance	Poa secunda - Muhlenbergia richardsonis - Carex douglasii Alliance	Salix lasiolepis Alliance	Salix boothii - Salix geyeriana - Salix lutea Alliance	Eleocharis (acicularis, macrostachya) Alliance	Navarretia leucocephala ssp. minima - Plagiobothrys cusickii Alliance	Sarcobatus vermiculatus Alliance	Distichlis spicata Alliance	Elymus cinereus – Elymus triticoides Alliance	Columbia Plateau cliff, scree and rock Mapping Unit	Total
10000	Forest and Woodland Class	1																																					1
11111	Abies concolor Alliance		13	1			1																																15
12110	Populus tremuloides Alliance			5																																			5
14100	Central Rocky Mountain Ponderosa Pine Open Woodland Group				1	1																																	2
14120	Pinus ponderosa / Shrub Understory Alliance					31	4	1						1						1																				38
16110	Juniperus occidentalis Alliance					1	52						1																											54
16210	Cercocarpus ledifolius Alliance						2	29						1				1		1																				34
22110	Ericameria nauseosa Alliance								4	2	1	1		3									2													1	1	1		16
22120	Bromus tectorum - Elymus caput-medusae Alliance									13	2												1													1		1	1		19
22210	Artemisia arbuscula Alliance						1				28			2									1																	32
22220	Artemisia nova Alliance										2																													2
22230	Eriogonum spp. / Poa secunda Alliance										3		1	1																										5
22310	Artemisia tridentata Alliance										3			23	1	3						1	2														1			34
22320	Artemisia tridentata ssp. vaseyana Alliance													2	22	2				2																				28
22330	Purshia tridentata - Artemisia tridentata Alliance										1			2	3	12																								18
24110	Chrysothamnus viscidiflorus Alliance								2									1								1														4
31100	Western North American Montane Scrub Group																																							0
31110	Ceanothus velutinus Alliance																	5																						5
31120	Prunus emarginata – Holodiscus discolor Alliance														1				5							3														9
31130	Arctostaphylos patula - Arctostaphylos nevadensis Alliance																	3		6																				9
32110	Festuca idahoensis - Pseudoroegneria spicata - Poa secunda Alliance								1	4	3		1	2	1						11						5													28
32120	Elymus smithii Unique Stands																																							0
41110	Artemisia cana Alliance													2									4																	6
41120	Salix boothii – Salix geyeriana – Salix lutea Alliance																																1	1					2
41130	Prunus virginiana Alliance																1									3													4
41300	Vancouverian - Rocky Mountain Montane Wet Meadow and Marsh Group																										1		3								1		5
41360	Danthonia californica – Deschampsia cespitosa – Camassia quamash Alliance																										1		1										2
41370	Juncus balticus - Juncus mexicanus Alliance									3													2				8	1	9							2			25
41380	Poa secunda - Muhlenbergia richardsonis - Carex douglasii Alliance																										1			2			1						4
43110	Salix exigua Alliance																								1															1
43110	Salix lasiolepis Alliance																																							0
44110	Eleocharis (acicularis, macrostachya) Alliance										1																3						1		2				7
44210	Navarretia leucocephala ssp. minima - Plagiobothrys cusickii Alliance																																		1				1
47110	Sarcobatus vermiculatus Alliance																																							0
48110	Distichlis spicata Alliance																																							0
48120	Elymus cinereus – Elymus triticoides Alliance																																							0
61100	Columbia Plateau cliff, scree and rock Mapping Unit																																						2	2
	Grand Total	1	13	6	1	33	60	30	7	22	44	1	2	38	30	17	0	1	10	7	8	11	1	12	1	7	19	1	13	2	1	1	0	3	1	6	5	2	417

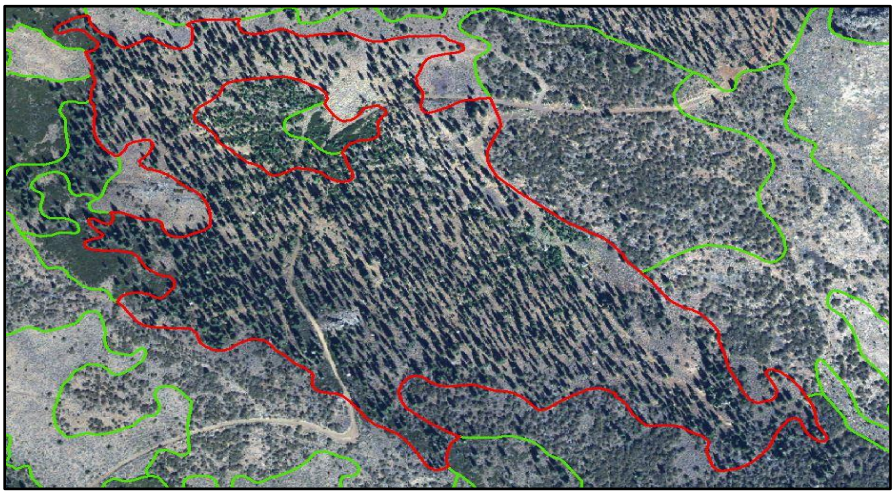
APPENDIX C: ADA FIGURE EXAMPLES

- Rules for formatting figures for ADA compliance:
    - Alternative Text
    - Figures, photos, etc. must have alternative text.
    - Figures, photos, etc. should be a single image.
    - Figures (and objects in general) should be in line with text. Text boxes and wrapping should be avoided.

Example of an image without alt text, and a graphic embedded on the photo rather than presented as a single image.



Example of an image with alt text. This image, with the red and green boundaries, however would be difficult for someone with color blindness to tell the difference between the two colors.



Below is an example of a map of survey points. All the survey points used for analysis should be included in the data analysis/recon effort. The points should be overlain on pertinent boundaries and data layers like project area(s), ecoregions, and orienting landmarks (water bodies, major cities, topography, etc.). Figure should include a clear description and legend. If appropriate, a secondary data frame indicating the extent rectangle for the project can also be included.

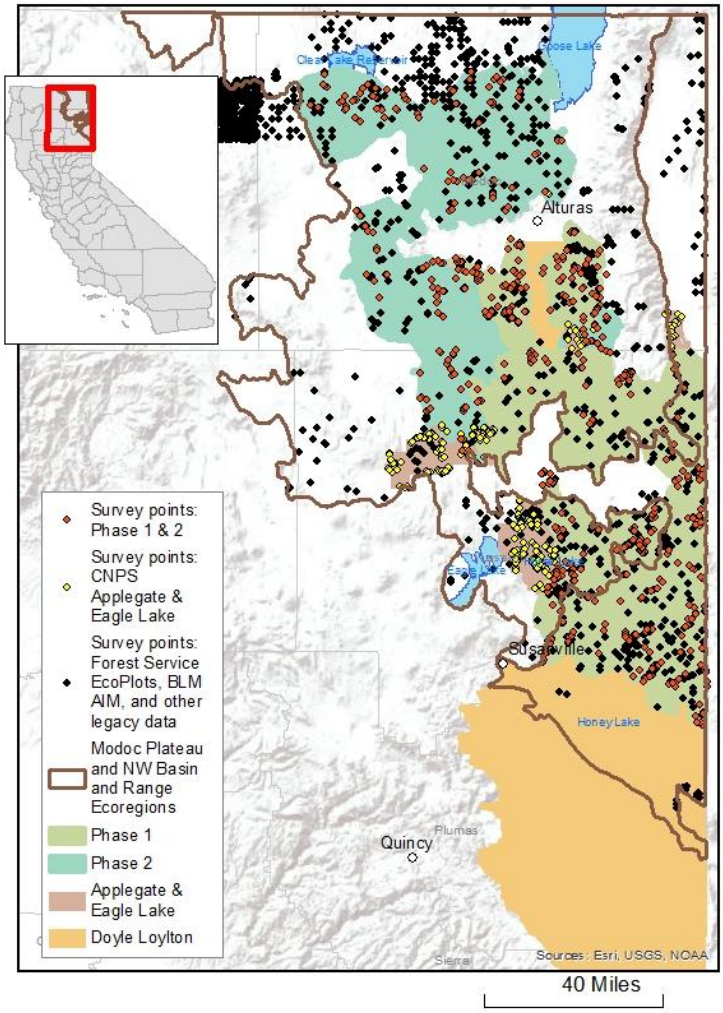


FIGURE 1: Field Survey Locations. Locations of the 2,059 surveys included in the final vegetation classification data analysis for the Modoc and Lassen vegetation mapping project. Orange points are the 627 samples collected specifically for the project by GIC and VegCAMP in 2016, 2017, and 2018. Yellow points are the 230 points collected in 2018 and 2019 by CNPS for a separate project. Black points are the 1,193 legacy surveys collected between 1985 and 2018 by BLM, the Forest Service, Lava Beds National Monument, and CDFW (Pine Creek and Fitzhugh Creek Wildlife Areas sampled by VegCAMP in 2006).

APPENDIX D: VEGETATION TYPE DESCRIPTIONS EXAMPLE

- The purpose of this appendix is to show an example of how to organize type descriptions so they are easy to navigate – formatting may differ
- Headings for community type, alliance, and association are different from the headings used in the main body of the report to ease creation of a separate table of contents
- The same rules for tables apply: Have a consistent table format, include row headers, no merged cells, and no blank cells. There needs to be the same number of columns in each row and the same number rows in each column.
- White text can be used in lieu of a blank cell if accurate information is placed in the cell such as N/A or No. X should not be used in place of Yes. This allows the Accessibility Reader to pick up its meaning while maintaining a cleaner look.
- Keep in mind that bolding is not read by an Accessibility Reader so should not be used as data itself.

Contents

Abies concolor Alliance

Common Name: White fir forest Alliance

NVC Alliance Code: A3420. *Abies concolor* Dry Forest & Woodland Alliance

Alliance Concept

The *Abies concolor* Alliance forms an open to continuous tree canopy with a sparse to intermittent shrub understory. It is found primarily on north-facing slopes. Soils are derived from a variety of substrates but primarily andesite, volcanics, and basalt, and soil texture is loamy. Elevation range is approximately 1554 – 2344 meters. The dominant tree is *Abies concolor* and *Symphoricarpos rotundifolius* is often present in the shrub layer.

Diagnostic Criteria: This alliance is characterized by an open to continuous tree canopy of *Abies concolor,* which ranges from 6 to 93 percent cover. The overall tree cover ranges from 10 to 93 percent.

Local Alliance Distribution

Modoc Plateau: Adin Mountains and Valleys (M261Gl), Crowder Flat (M261Gc), Eagle Lake - Observation Peak (M261Gm), Horsehead Mountain (M261Gk), Likely Mountain (M261Gi), Likely Tableland (M261Gh), Warner Mountains (M261Gf)

Northwestern Basin and Range: Medicine Lake Lava Flows (M261Dh)

Southern Cascades: Medicine Lake Lava Flows (M261Dh)

Associations

Abies concolor – Pinus ponderosa / *Cercocarpus ledifolius* Association

Environmental Description

Plot/Sample Data Environmental Summary:

Elevation: Mean 1924 m, Range 1554 – 2344 m

Aspect: NE (14), NW (12), SE (4), SW (2)

Slope: Mean 16.0 degrees, Range 2 – 30 degrees

Macro Topography: Upper 1/3 of slope (9), Middle 1/3 of slope (6), Middle to Upper 1/3 of slope (5), Lower 1/3 of slope (3), Lower to Upper 1/3 of slope (2), Ridge summit, crest (2), Bottom (1), Upper 1/3 of slope to Ridgetop (1), Midslope (1), Lower to Middle 1/3 of slope (1), Draw, intermittent stream bottom (1)

Tree Cover: Mean 18.7%, Range 10 – 93%

Shrub Cover: Mean 5.1%, Range 0 – 40%

Herb Cover: Mean 13.3%, Range 0.2 – 61%

Large Rock: Mean 3.8%, Range 0 – 12%

Small Rock: Mean 8%, Range 0 – 39%

Fines Cover: Mean 8.4%, Range 0 – 43%

Litter Cover: Mean 74.5%, Range 15 – 98%

Soil Texture (field assessed): Medium to very fine, sandy loam (3), Coarse, loamy sand (2), Medium loam (2), Moderately coarse, sandy loam (2), Moderately fine sandy clay loam (2), Medium silt loam (1), Moderately fine clay loam (1), Sandy Loam (1)

Geology (map data): Andesite (11), General volcanic extrusives (7), Basalt (5)

Environment: Stands of *Abies concolor* within the Modoc Plateau and NW Basin and Range ecoregions are restricted to the highest elevations where the summer-time temperatures are more moderate and precipitation is higher than at the lower elevation ranges.

Vegetation Description

Vegetation Structure: The alliance forms an open to continuous tree layer with a sparse to intermittent shrub layer and sparse to intermittent herbaceous understory.

Vegetation Floristics: The dominant tree is *Abies concolor* in the overstory. *Symphoricarpos rotundifolius* is often present in the shrub layer.

Dynamics: *Abies concolor* is a large, long-lived conifer that tends to increase in areas that have not burned recently. The ecological amplitude of *Abies concolor* is broader than for other firs in California. It is the only member of the genus within the study area.

Species of Interest: *Hackelia cusickii* and *Silene oregana*

Classification Confidence: High

Conservation Status Rank

Global: G4 **State:** S5

References

None

Total Sample Size Used for Description: N=32

Alliance Stand Table

Abies concolor Alliance

n =32

Lifeform	Botanical Name	Con	Avg	Min	Max
Tree					
	Abies concolor	100	26.88	6	93
	Pinus ponderosa	50	12.86	1	48
	Juniperus occidentalis	19	1.65	0.2	3.5
	Pinus jeffreyi	19	14.03	0.2	35
Sapling					
	Abies concolor	78	3.48	0.2	12
	Pinus jeffreyi	13	3.3	0.2	7
Seedling					
	Abies concolor	81	2.08	0.2	11
	Pinus ponderosa	13	0.6	0.2	1
Shrub					
	Symphoricarpos rotundifolius	53	2.75	0.2	25
	Amelanchier utahensis	31	0.98	0.2	3
	Ribes velutinum	28	0.89	0.2	3
	Cercocarpus ledifolius	25	1.23	0.2	4
	Ribes cereum	25	0.6	0.2	1

Alliance Stand Table continued

Abies concolor Alliance

n =32

Lifeform	Botanical Name	Con	Avg	Min	Max
Herb					
	Prunus virginiana	19	3.57	0.2	18
	Mahonia aquifolium	19	0.73	0.2	1
	Ceanothus velutinus	16	2.64	0.2	5
	Ribes viscosissimum	16	8.8	1	40
	Artemisia tridentata ssp. *vaseyana*	13	1.35	0.2	4
	Prunus emarginata	13	1.3	0.2	2
	Ribes	13	1	1	1
	Artemisia tridentata	13	0.2	0.2	0.2
	Arctostaphylos patula	13	2.23	0.2	7.5
Herb					
	Collinsia parviflora	41	1.82	0.2	15
	Elymus elymoides	34	0.35	0.2	1
	Arnica cordifolia	34	8.75	0.2	30
	Pseudostellaria jamesiana	31	8.32	0.2	30
	Maianthemum racemosum	22	1.74	0.2	7
	Osmorhiza chilensis	22	1.03	0.2	2
	Viola purpurea	22	0.69	0.2	2
	Wyethia mollis	19	0.97	0.2	4
	Carex rossii	19	1.87	0.2	6
	Collomia grandiflora	19	0.2	0.2	0.2
	Poa secunda	19	1.1	0.2	3
	Poa wheeleri	16	0.84	0.2	1
	Maianthemum stellatum	16	0.52	0.2	1
	Hieracium horridum	16	0.88	0.2	2
	Galium aparine	16	0.52	0.2	1
	Elymus glaucus	16	1.84	0.2	5
	Cryptantha	16	0.52	0.2	1
	Aquilegia formosa	16	0.68	0.2	1
	Bromus carinatus	16	1.48	0.2	3
	Phacelia humilis	13	0.68	0.2	2
	Hieracium scouleri	13	0.6	0.2	1
	Pyrola picta	13	0.8	0.2	1
	Hydrophyllum capitatum	13	0.8	0.2	1
	Bromus orcuttianus	13	1	1	1
	Osmorhiza occidentalis	13	1.05	0.2	2

Abies concolor – Pinus ponderosa / *Amelanchier alnifolia* Association

Common Name: White Fir - Ponderosa Pine / Serviceberry

NVC Association Code: CEGL000014, *Abies lowiana - Pinus ponderosa* / *Amelanchier alnifolia* Forest

Alliance: *Abies concolor* Alliance

Association Concept

The *Abies concolor – Pinus ponderosa* / *Amelanchier alnifolia* Association forms an open to continuous tree canopy with a sparse to open shrub understory. It is found primarily on slopes, ridges, and draws with intermittent streams at all aspects. Soils are derived from a variety of substrates but primarily andesite, general volcanic extrusives, or basalt and textures vary widely. Elevations range from approximately 1554 to 2344 meters. The dominant tree is *Abies concolor,* and *Pinus ponderosa* is often present.

Diagnostic Criteria: This association is characterized by an open to continuous tree canopy of *Abies concolor* which ranges from 6 to 93 percent cover. The overall tree cover ranges from 10 to 93 percent.

Environmental Description

Plot/Sample Data Environmental Summary:

Elevation: Mean 1895 m, Range 1554 – 2344 m

Aspect: NE (12), NW (10), SE (4), SW (2)

Slope: Mean 15.4 degrees, Range 2 – 30 degrees

Macro Topography: Middle 1/3 of slope (6), Upper 1/3 of slope (5), Middle to Upper 1/3 of slope (5), Lower 1/3 of slope (3), Ridge summit, crest (2), Lower to Upper 1/3 of slope (2), Lower to Middle 1/3 of slope (1), Midslope (1), Draw, intermittent stream bottom (1), Bottom (1), Upper 1/3 of slope to Ridgetop (1)

Tree Cover: Mean 17%, Range 10 – 93%

Shrub Cover: Mean 3.3%, Range 0.2 – 11%

Herb Cover: Mean 10.4%, Range 0.2 – 61%

Large Rock: Mean 3.8%, Range 0 – 12%

Small Rock: Mean 8%, Range 0 – 39%

Fines Cover: Mean 9.3%, Range 0 – 43%

Litter Cover: Mean 73.8%, Range 15 – 98%

Soil Texture (field assessed): Not recorded (6), Medium to very fine, sandy loam (3), Coarse, loamy sand (2), Medium loam (2), Moderately coarse, sandy loam (2), Moderately fine sandy clay loam (2), Sandy Loam (1), Medium silt loam (1), Moderately fine clay loam (1)

Geology (map data): Andesite (7), General volcanic extrusives (7), Basalt (5)

Vegetation Description

Vegetation Structure: The association forms an open to continuous tree layer with a sparse to open shrub layer and sparse or intermittent herbaceous understory.

Vegetation Floristics: The dominant tree is *Abies concolor* in the overstory, and *Pinus ponderosa* is often present.

Dynamics: *Abies concolor* is dominant to co-dominant in the tree layer with *Pinus ponderosa* or *Pinus* jeffreyi. *Juniperus occidentalis* may be present but insignificant. Higher elevation, cold-tolerant shrubs are present and may include *Amelanchier utahensis, Cercocarpus ledifolius, Ribes* spp., *Symphoricarpos rotundifolius, Artemisia tridentata* ssp. *vaseyana,* and *Prunus* spp.

Species of Interest: *Hackelia cusickii, Silene oregana*

Classification Comments

None.

Classification Confidence: High

Conservation Status Rank

Global: GNR **State:** N

References

None.

Total Sample Size Used for Description: N=28

Association Stand Table

Abies concolor – Pinus ponderosa / Amelanchier alnifolia Association

n =28

Lifeform	Botanical Name	Con	Avg	Min	Max
Tree					
	Abies concolor	100	22.93	6	93
	Pinus jeffreyi	21	14.03	0.2	35
Sapling					
	Abies concolor	75	3.2	0.2	12
	Pinus jeffreyi	14	3.3	0.2	7

Association Stand Table continued

Abies concolor – Pinus ponderosa / *Amelanchier alnifolia* Association

n =28

Lifeform	Botanical Name	Con	Avg	Min	Max
Seedling					
	Juniperus occidentalis	11	0.63	0.2	1.5
	Abies concolor	79	2.28	0.2	11
	Pinus ponderosa	14	0.6	0.2	1
	Juniperus occidentalis	11	0.2	0.2	0.2
	Pinus jeffreyi	11	2.67	2	3
Shrub					
	Symphoricarpos rotundifolius	46	1.45	0.2	7
	Amelanchier utahensis	36	0.98	0.2	3
	Ribes velutinum	32	0.89	0.2	3
	Cercocarpus ledifolius	29	1.23	0.2	4
	Ribes cereum	29	0.6	0.2	1
	Mahonia aquifolium	21	0.73	0.2	1
	Prunus virginiana	21	3.57	0.2	18
	Ceanothus velutinus	18	2.64	0.2	5
	Prunus emarginata	14	1.3	0.2	2
	Artemisia tridentata ssp. *vaseyana*	14	1.35	0.2	4
	Artemisia tridentata	14	0.2	0.2	0.2
	Arctostaphylos patula	14	2.23	0.2	7.5
	Ribes	14	1	1	1
	Ceanothus prostratus	11	0.73	0.2	1
	Ericameria nauseosa	11	0.47	0.2	1
	Symphoricarpos	11	0.73	0.2	1
	Collinsia parviflora	43	0.72	0.2	3
	Elymus elymoides	39	0.35	0.2	1
	Arnica cordifolia	25	9.89	0.2	30
	Poa secunda	21	1.1	0.2	3
	Wyethia mollis	21	0.97	0.2	4
	Pseudostellaria jamesiana	21	6.87	0.2	30
	Collomia grandiflora	21	0.2	0.2	0.2
	Carex rossii	21	1.87	0.2	6
	Viola purpurea	21	0.63	0.2	2
	Bromus carinatus	18	1.48	0.2	3
	Cryptantha	18	0.52	0.2	1

Association Stand Table continued

Abies concolor – Pinus ponderosa / *Amelanchier alnifolia* Association

n =28

Lifeform	Botanical Name	Con	Avg	Min	Max
Shrub					
	Galium aparine	18	0.52	0.2	1
	Maianthemum racemosum	18	2.04	0.2	7
	Maianthemum stellatum	18	0.52	0.2	1
	Poa wheeleri	18	0.84	0.2	1
	Elymus glaucus	14	1.05	0.2	2
	Osmorhiza chilensis	14	1.05	0.2	2
	Phacelia humilis	14	0.68	0.2	2
	Hieracium scouleri	14	0.6	0.2	1
	Hieracium horridum	14	0.85	0.2	2
	Lupinus	14	0.6	0.2	1
	Melica bulbosa	11	0.2	0.2	0.2
	Stellaria longipes	11	0.47	0.2	1
	Silene	11	0.47	0.2	1
	Senecio aronicoides	11	1.33	1	2
	Phacelia hastata	11	0.2	0.2	0.2
	Osmorhiza occidentalis	11	1.07	0.2	2
	Lupinus arbustus	11	1.07	0.2	2
	Kelloggia galioides	11	1	1	1
	Hydrophyllum capitatum	11	0.73	0.2	1
	Festuca idahoensis	11	0.2	0.2	0.2
	Claytonia rubra	11	0.2	0.2	0.2
	Bromus tectorum	11	1.07	0.2	2
	Penstemon	11	0.8	0.2	2

APPENDIX E: INSTRUCTIONS FOR GENERATING MAIL MERGE VEGETATION TYPE DESCRIPTIONS

MAIL MERGE INSTRUCTIONS

Basic instructions for generating mail merge vegetation type descriptions based on the approach used for the Modoc – Lassen Classification Report:

1. Make a copy of a vegetation database for mail merge editing.
2. Create mail merge tables in your database, these are tables containing the name of the vegetation type with relevant attributes. The mail merge template will be populated using information from these fields.
    a. Consider which attributes you will need for your description. Examples: minimum and maximum elevation, aspect, slope, long text fields for listing the names of dominant or characteristic species
    b. Create separate tables for each level of classification needing descriptions (likely just alliances and associations).
    c. These tables are populated using summarized information from vegetation surveys. Using a make table query to create an initial table with basic information such as elevation, slope, aspect, and ground cover is a simple approach that will minimize the amount of work needed to fill out the table.
3. Summarize important plant species for each type based on dominance
    a. This step may not be necessary if this information is not desired in your vegetation type description. Stand tables present this information in another format but listing the plant species that define the type in the description can make for an easier-to-read summary.
    b. Species dominance and related data are determined using relative cover and constancy. Suggested definitions for these terms and more are included in the glossary at the end of this appendix. Constancy and average relative cover should be included in stand tables for querying.
    c. Species constancy represents the percentage of plots of a vegetation type in which a species is present. For example, if *Abies concolor* is in one plot out of four it has a constancy of 0.25 or 25%.
    d. Average relative cover represents the cover of a species relative to other species in the same plot.
    e. Using the constancy and relative cover values, follow the rules laid out in the glossary to determine which species are dominant, characteristic, often present, etc. for each vegetation type. Create a table listing all of the species in each vegetation type, separated by stratum, with fields that track whether they are dominant, characteristic, often present, etc.
        i. The dominant, characteristic, often present, etc. species can then be placed into a concatenated list field for each vegetation type

4. Concatenated list fields
    a. Text values like references, topography, substrate, etc. can be put into lists which must be contained in long text (memo) fields if they exceed 255 characters. There are multiple methods to achieve this result. Instructions for the method used in the MOLA classification report are included below this outline.
5. Create mail merge document templates
    a. Link your mail merge document to the database containing your tables
        i. In the Mailings tab of Word, click Select Recipients, then Use an Existing List, navigate to your database and open it. You'll be asked to link the correct table from the database, this will be the mail merge table for the classification level for which you're generating descriptions.
    b. Create an outline with the basic desired look of the vegetation description and insert merge fields (use the Mailings tab) as necessary. It may be useful to work from an existing template for this step.
        i. There will often be further details to add at the end of the process, mail merging is used to place quantifiable data in a structure that can be edited later for clarity.
        ii. The number of decimal places displayed by a numeric field can be changed by right clicking a merge field, clicking "Toggle Field Codes" and adding "\#0.x" where x is a number of zeroes representing how many numbers will come after the decimal. For example: {MERGEFIELD "MinOfConif_cover" \#0.0} would display the number from the MinOfConif_cover field to one decimal place.
    c. In the Mailings tab, click Finish & Merge, then edit individual documents. Save the resulting document as a draft and edit as needed.

VBA CONCATENATOR INSTRUCTIONS

This code is designed to avoid the issue of truncation in long concatenated fields which happens when populating with a series of values that exceeds a lower limit. Other methods may be more efficient in certain circumstances, especially if concatenating fields with less than 255 characters.

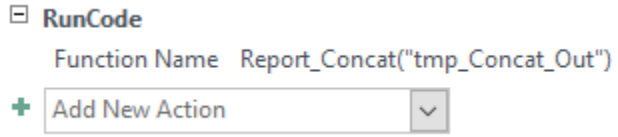
Copy and paste the code below into a new module in your access database (Ctrl + G will open the VBA window).

```
'************************************************************************
Public Function Report_Concat( _
    strOutTable As String, _
Optional strWhere As String, _
    Optional strOrderBy As String, _
    Optional strSeparator = ", ")
```

```
' This function takes a 2-column input table and concatenates the second
column
'   depending on breaks in the first
' You must supply the input and the output table names

' Declare the local variables
    Dim tmpDb As DAO.Database
    Dim tmpInRec As DAO.Recordset
    Dim tmpOutRec As DAO.Recordset
    Dim strConcat As String
    Dim strInTable As String
    Dim strOldVegType As String
    Dim strVegType As String
    Dim tmpSQL As String

    Set tmpDb = CurrentDb

' First get the name of the input table
strInTable = InputBox("Please enter the name of the input table")
If Len(strInTable) = 0 Then
    MsgBox "exiting - input table name cannot be blank"
    GoTo Exit_Report_Concat
End If

' Clear the output table
    tmpSQL = "DELETE * from " & strOutTable
    'DoCmd.SetWarnings False
    DoCmd.RunSQL tmpSQL
    DoCmd.SetWarnings True

' Get the first input record
    tmpSQL = "Select * from " & strInTable
    Set tmpInRec = tmpDb.OpenRecordset(tmpSQL)
' If we don't find one, put up a message and exit
    If tmpInRec.EOF Then
        MsgBox strInTable & "is empty"
        GoTo Exit_Report_Concat
    End If

' Set up the first record before we start the loop
strOldVegType = tmpInRec(0).Value
strConcat = tmpInRec![expr1]
tmpInRec.MoveNext
' Note: this code should be used in a macro.

' Open the output table so that we can write to it
Set tmpOutRec = tmpDb.OpenRecordset(strOutTable)

' Loop through the input table, starting with the second record
Do While Not tmpInRec.EOF
    strVegType = tmpInRec(0).Value
    If strVegType = strOldVegType Then
        strConcat = strConcat & strSeparator & tmpInRec![expr1]
```

```
    Else
        'write the record
        tmpOutRec.AddNew
        tmpOutRec![VegType] = strOldVegType
        tmpOutRec![Concat_out] = strConcat
        tmpOutRec.Update
        'reset the vegtype and start the concat
        strOldVegType = strVegType
        strConcat = tmpInRec![expr1]
    End If
    tmpInRec.MoveNext
Loop

'write the final record
tmpOutRec.AddNew
tmpOutRec![VegType] = strOldVegType
tmpOutRec![Concat_out] = strConcat
tmpOutRec.Update

Exit_Report_Concat:
' Clear the variables
    strConcat = ""
    strOldVegType = ""
    strVegType = ""
    tmpSQL = ""
    Set tmpInRec = Nothing
    Set tmpOutRec = Nothing
    Exit Function

Err_Report_Concat:
    MsgBox Err.Description
    Resume Exit_Report_Concat

End Function
'*************************************************************************
```

The next step is to create a macro that looks like this:



Where “tmp_Concat_Out” is an empty table in your database with 2 long text (aka memo) fields:

Field Name	Data Type
VegType	Long Text
Concat_out	Long Text

What this code does is take a 2-column table (or select query) and concatenate the values from the second column into a long text field based on the values in the first

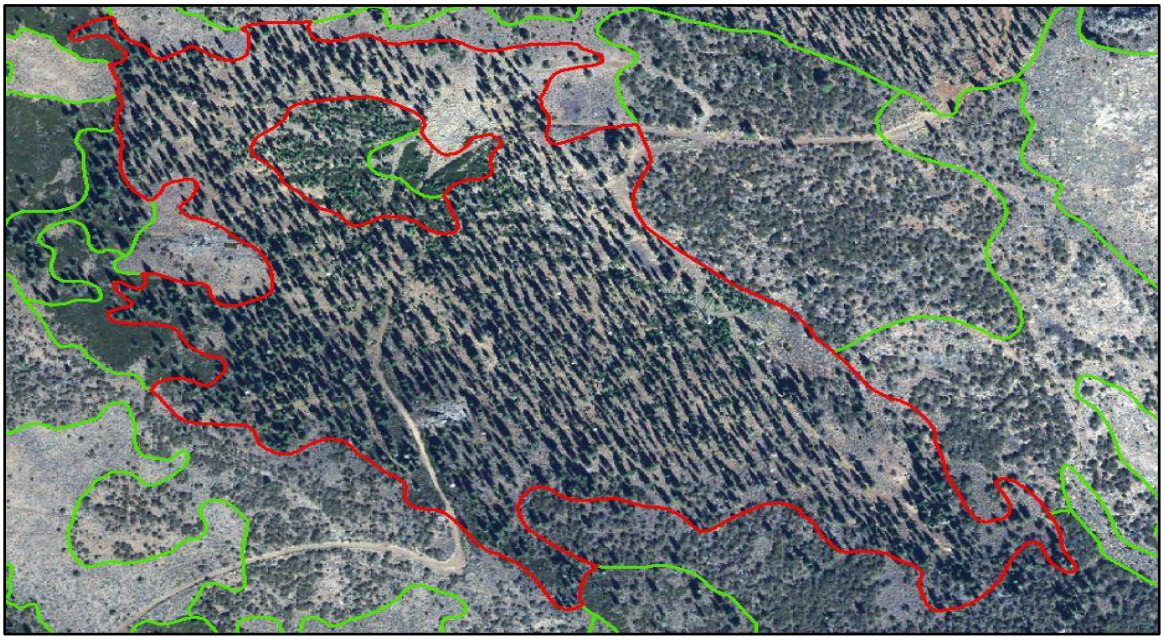
column. Your source table/query should have a one-to-many relationship between the first and second columns. As a default, the second column in your originating table will need to be titled “Expr1” but you can change this within the code by changing the name at the 3 locations highlighted in yellow above. You can additionally change what goes between the concatenated values by changing the red highlighted variable at the top of the code. For example, to insert a carriage return between values, remove “ ,” and replace it with vbCrLf (note the lack of quotation marks.)

If you want to use the generated table to populate a field in another table via an update query, you will have to change the data type of the column you are using for a join. If changing to short text, ensure that you set the field size appropriately for the length of your data – the maximum for short text is 255. Given that this process is designed to produce a concatenated long text field in the second column, you will want to rely on the data in the first column for joins.

APPENDIX F: MAP CLASS DESCRIPTIONS EXAMPLE

Abies concolor Alliance (11110)

White fir forest Alliance



The aerial view shows an open previously logged stand of *Abies concolor*. The understory is shrubby with *Prunus, Ceanothus*, and regenerating pines.

This is an open stand with an overstory of *Abies concolor*, and an understory of regenerating *Pinus ponderosa*.

Abies concolor Alliance (11110)

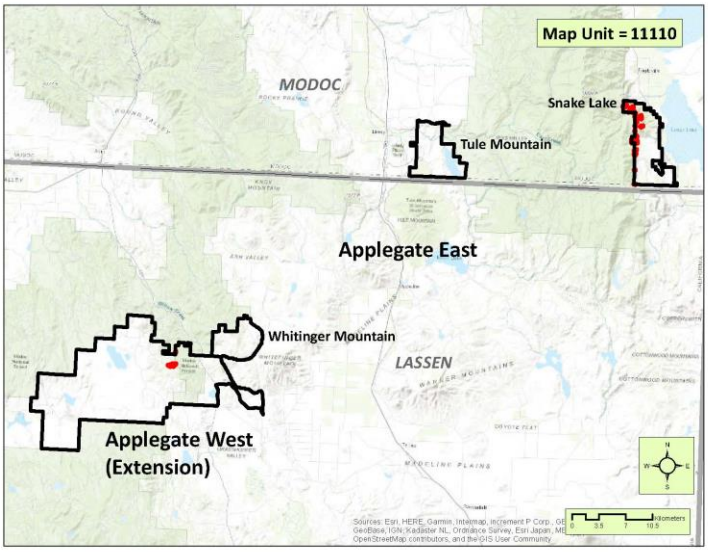
DESCRIPTION: *Abies concolor* is dominant to co-dominant in the tree layer. *Pinus ponderosa* or *Pinus jeffreyi* are co-dominant to absent. *Juniperus occidentalis* may be present, but at very low cover.

PHOTOINTERPRETATION SIGNATURE: *Abies concolor* has a narrower more conical shape than other conifers; especially pines. Colors trend more blue-green than pine. Cover is generally higher than either juniper or pine woodlands stands. Limited at lower elevations in riparian and north-trending slopes where it often interfaces with *Pinus ponderosa* or *P. jeffreyi. Pinus ponderosa* and *P. jeffreyi* both have a medium to large, rounded dense crown with branching extending broadly to the mid-crown.

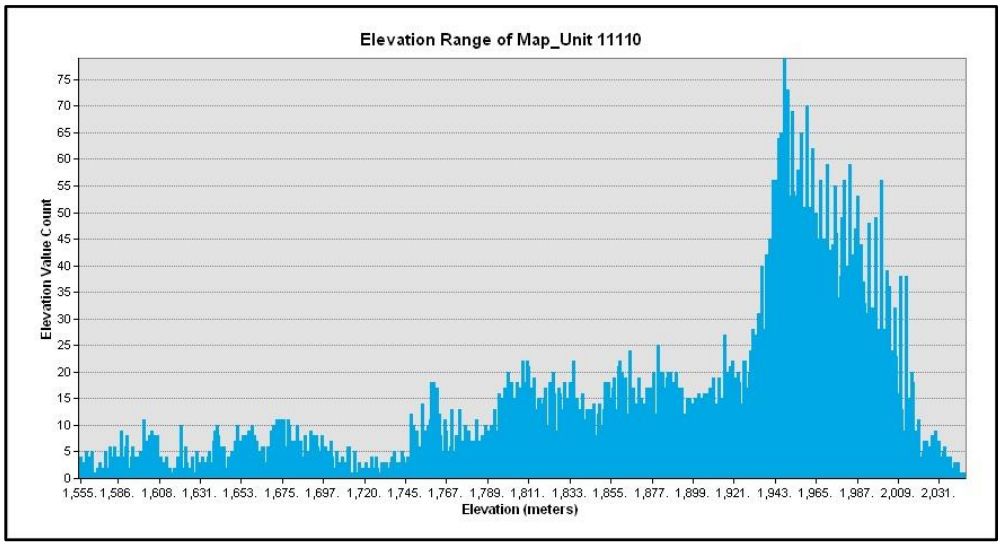
TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

- Types dominated by *Pinus ponderosa* and *Pinus jeffreyi* are found adjacent at lower elevations and generally have a larger more rounded crown, however *P. jeffreyi* can overlap with *Abies* in elevation. Pines in general usually have a yellow-green color. Crowns tend to be more open.

Abies concolor Alliance (11110)



DISTRIBUTION: *Abies concolor* is mapped at the Alliance level primarily on the east slopes of the Warner Mountains in the Snake Lake subunit. A small stand is identified east of Silva Flat Reservoir on a north slope near Four-Pine spring in the Applegate Extension subunit.



Abies concolor – Pinus ponderosa / Amelanchier alnifolia Association (11111)

White fir – Ponderosa pine / Serviceberry Association

The aerial view depicts a dense, previously logged stand of *Abies concolor*. The stand trends north to northwest averaging about 7200 feet.

This ground photo shows open margins of the stand depicting an open grassy understory with minimal shrub cover.

Abies concolor – Pinus ponderosa / Amelanchier alnifolia Association (11111)

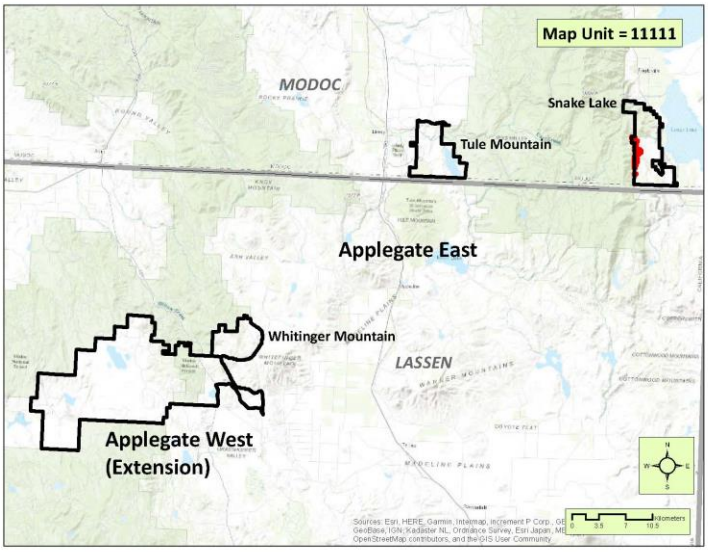
DESCRIPTION: *Abies concolor* is dominant to co-dominant in the tree layer. *Pinus ponderosa* or *Pinus jeffreyi* is co-dominant to absent. *Juniperus occidentalis* may be present but insignificant. Higher elevation, cold-tolerant shrubs are present and may include *Amelanchier utahensis, Cercocarpus ledifolius, Ribes* spp., *Symphoricarpos rotundifolius, Artemisia tridentata* ssp*. vaseyana, and Prunus* spp*.* The shrub and herb layers are characteristically sparse (less than 10% absolute cover) and are low in species diversity.

PHOTOINTERPRETATION SIGNATURE: *Abies concolor* has a narrower more conical shape than other conifers; especially pines. Colors trend more blue-green than pine. Cover is generally higher than either juniper or pine woodlands stands. Limited at lower elevations in riparian and north-trending slopes where it often interfaces with *Pinus ponderosa* or *P. jeffreyi.*

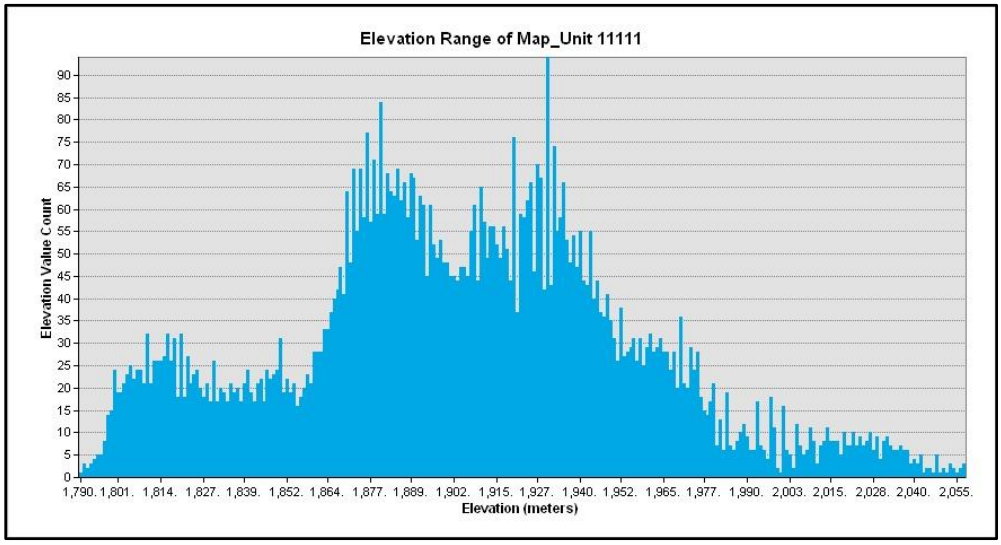
TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

- Types dominated by *Pinus ponderosa* and *Pinus jeffreyi* are found adjacent at lower elevations and generally have a larger more rounded crown, however *P. jeffreyi* can overlap with *Abies* in elevation. Pines in general usually have a yellow-green color. Crowns tend to be more open.

Abies concolor – Pinus ponderosa / Amelanchier alnifolia Association (11111)



DISTRIBUTION: This Association is found on steep east-trending slopes in elevations as low as 6200 feet along the eastern side of the Warner Mountains in the Snake Lake subunit. It is not mapped in the other subunits.



APPENDIX G: GLOSSARY OF TERMS

Taken from the National Park Service 2018 Channel Islands Classification Report

- **Absolute cover** – Refers to the actual percentage of the ground (surface of the plot or stand) that is covered by a species or group of species. Absolute cover of all species or groups if added in a stand or plot may total greater or less than 100% because it is not a proportional number.
- **Characteristic** – Present in at least 75% of the samples for that vegetation type, with no restriction on cover.
- **Co-dominant** – Two or more abundant species with high cover in relation to other species in the layer with the highest canopy cover. We typically define co-dominant species as those with at least 30% relative cover.
- **Cover** – The primary metric used to quantify the abundance of a particular species or a particular vegetation layer within a plot. It was measured by estimating the aerial extent of the living plants, or the "bird's-eye view" looking from above for each category.
- **Dense/Continuous cover** – Used to describe individual layers of vegetation (tree, shrub, herb, or subdivisions of them) where there is greater than 66 percent absolute cover.
- **Dominant** – An abundant species with high cover in relation to other species in the layer with highest canopy cover. We typically define dominant species as those with at least 50% relative cover within a particular layer.
- **Emergent** – A plant (or vegetation layer) is considered emergent if it includes plants that rises above a predominant vegetation layer, but that are sparse in cover. It is considered as a member of the next tallest layer, but typically has an absolute cover < 10%.
- **Herb** – Is any vascular plant species that has no main woody stem-development, and includes grasses, forbs, and perennial species that die-back seasonally.
- **Open** – Used to describe individual layers of vegetation (tree, shrub, herb, or subdivisions of them) where the cover is less than 33 percent absolute cover.
- **Relative cover** – Refers to the amount of the surface of the plot or stand sampled that is covered by one species (or physiognomic group) as compared to (relative to) the amount of surface of the plot or stand covered by all species (in that group). Thus, 50% relative cover means that half of the total cover of all species or physiognomic groups is composed of the single species or group in question. Standardized layers of herb, shrub, and tree are used to determine relative cover. Relative cover values are proportional numbers and, if added, total 100% for each stand (sample).
- **Semi-natural vegetation** – Stands characterized by naturalized non-native species. Note that NVC vegetation types use "ruderal" to describe these plant communities.
- **Shrub** – Is normally a multi-stemmed woody plant that generally has several erect, spreading, or prostrate stems and that is usually between 0.2 meters and 5 meters tall, giving it a bushy appearance. Definitions are blurred at the low and the high ends of the height scales. At the tall end, shrubs may approach trees in size

(*Heteromeles arbutifolia,* often appears tree-sized on Santa Rosa Island. At the low end, woody perennial herbs or sub-shrubs of various species are often difficult to categorize into a single life-form; usually sub-shrubs (per USDA-NRCS 2014) were categorized in the “shrub” category.

- **Sometimes** – Present in 25 to 50% of the samples with no restriction on cover.
- **Sparse** – Used to describe individual layers of vegetation (tree, shrub, herb, or subdivisions of them) where the *average* cover value is <2% absolute cover (though the range in cover could be <1-9% cover).
- **Stand** – The basic physical unit of vegetation in a landscape. It has no set size. Some vegetation stands are very small such as wetland seeps, and some may be several square kilometers in size such as desert or forest types. A stand is defined by two main unifying characteristics:
    - 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 gradual.
    - It has *structural* integrity. It has a similar history or environmental setting, affording relatively similar horizontal and vertical spacing of plant species. For example, a hillside forest formerly dominated by the same species, but that has burned on the upper part of the slope and not the lower is divided into two stands. Likewise, a sparse woodland occupying a slope with shallow rocky soils is considered a different stand from an adjacent slope of a denser woodland/forest with deep moister soil and the same species.
- **Sub-dominant –** Used to describe an important species in the stand that is less than 30% relative cover.
- **Tree** – Is a one-stemmed woody plant that normally grows to be greater than 5 meters tall. In some cases trees may be multiple-stemmed (ramifying) after fire or other disturbance, but size of mature plants is typically greater than 5 m and undisturbed individuals of these species are usually single stemmed.
- **Usually/Often** – Present in 50 to 75% of the samples, with no restriction on cover.